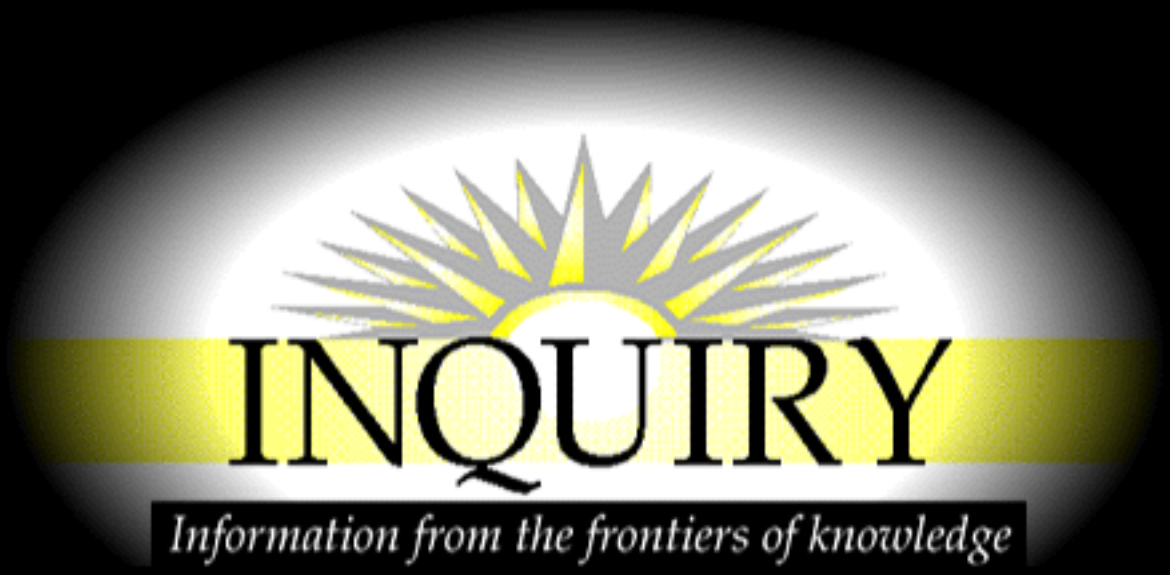

A magazine highlighting research at the University of Oregon

Fall 2001, Volume VII, Number 2

- **Riverfront Research Park is Home to Start-ups, Spin-offs**

Riverfront Research Park

- **High-Tech Institute Listens to Business, Preps Students With Practical Training, Internships**

Materials Science Institute

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About INQUIRY...

Return to University of Oregon News and Calendar Page.

INQUIRY

Fall 2001

Powerful Engine for State Economy Revving at UO

Research VP says university contributes to Oregon economy while advancing knowledge, training next generation

---

.The role of the research university has never been more important, its contributions never more critical in facing the challenges of the twenty-first century, including the unprecedented pace of scientific, technological, and global change.


Rich Linton

."The extensive research activities of the University of Oregon are generating new knowledge, as well as translating fundamental discoveries into practical applications," says Rich Linton, UO vice president for research and graduate studies. "The economic and societal benefits that come to the state because of the UO's core research programs are significant in terms of job and business creation, workforce development, and an enhanced quality of life for Oregonians. These positive impacts are both immediate and long-term."

.This publication focuses on the university's extensive efforts with the Oregon business community to foster mutually beneficial relationships involving research and economic development.

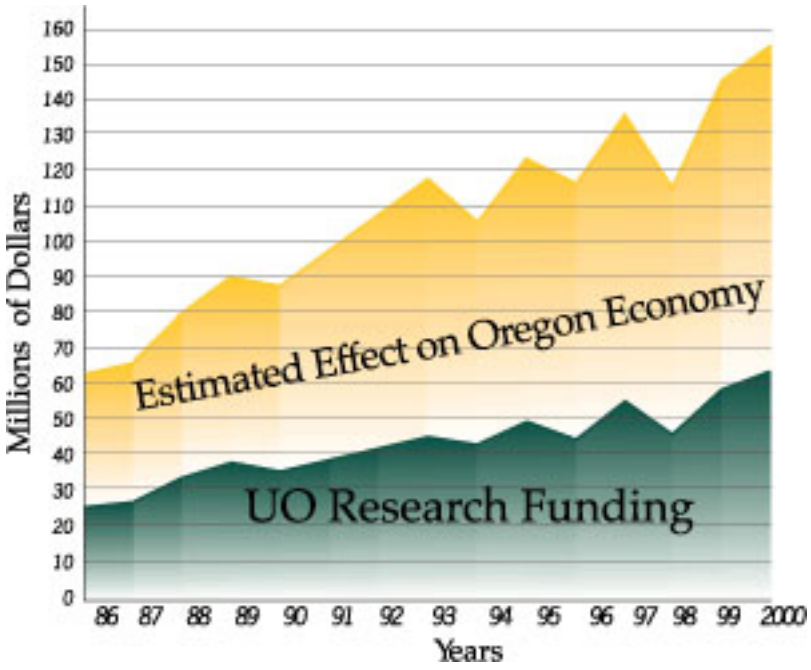
.Research is Good Business

."The economic benefits of investments in university research are impressive," Linton says. "The UO research enterprise is responsible for thousands of jobs and many millions of dollars of earned income to Oregon workers and their families."

.Research and sponsored programs at the UO alone will attract approximately $60 million in competitively awarded grants and contracts this year. Such support is becoming comparable in size to

the total funding that UO receives, about $75 million annually, in state appropriations for all purposes. In addition, less than 2 percent of the state's direct appropriations to higher education are designated specifically for research activities. Simply put, there is enormous leveraging of the relatively modest state investment in UO research.

About 28 percent of the UO's annual operating expenditures are provided by contracts and grants, the vast majority of which comes from federal agencies. Each dollar devoted to academic research also has been shown to create at least one to two additional dollars in new economic activity. In addition to the direct effects of wages and salaries paid to UO employees, the university purchases goods and services from local businesses. There are also indirect effects as these first receivers of research expenditures, in turn, purchase goods and services. Considering these "multiplier effects," UO research is estimated to contribute in excess of $150 million annually into the Oregon economy (see graph).



Research funds flow into state economy. UO research funding (green area), which comes mostly from federal sources, is now more than $60 million annually. Economists use "multiplier effects" to calculate what this infusion means to the Oregon economy (yellow area).

According to recent figures reported by the U.S. Commerce Department, forty-five jobs are supported by every million dollars of research grant support received by the UO. At current levels of sponsored funding, this equates to 2,700 jobs, including those directly related to UO faculty, staff, and student positions. Approximately 1,200 students are employed as graduate assistants, many of them working directly on sponsored research projects that provide their salaries. In addition, roughly one of every two UO graduate students resides in Oregon following graduation.

The university is not only generating workers with advanced skills, but it is also supporting the creation of new businesses. Specifically, the UO is engaged in the transfer of new discoveries and technologies developed on-campus into private-sector companies or start-ups (see story). When expressed as a function of sponsored research expenditures, technology transfer activities at the UO (e.g. invention disclosures, patents, licensing revenues, start-up companies created) compare very favorably with many of the best research universities nationally, including those with engineering and medical schools, and generally surpass other academic institutions in Oregon.

Where Research and Business Meet

"The UO is a place where the intersections of research and business should be encouraged," Linton

says. "The idea of working collaboratively with the business community for mutual benefit is increasingly important in the way we operate as a research university."

.Good examples are the fast-developing fields of molecular biology and neurosciences, areas of particular research distinction at the UO (see story). Innovative basic science conducted in UO laboratories is laying the groundwork for advances in biomedicine that involve new diagnostic and therapeutic agents. UO professors hold patents on potentially beneficial new drugs and diagnostic probes, they have formed biomedical spin-off companies, and they have invented new technologies and licensed them to entrepreneurial companies interested in turning such advances into clinical or research tools.

.The UO has the highest-ranked graduate science programs within Oregon. As one reflection of those strengths, UO faculty members have created partnerships to ensure that the innovative education, research, and training activities in the sciences are directly applicable to the practical needs of Oregon companies. The UO Materials Science Institute, for example (see story), has established close working relationships with many of Oregon's top engineering and high-technology companies through its popular graduate internship programs. The collaborative interplay is producing highly skilled university graduates at the interface of science and engineering who are in high demand for employment by industries in Oregon and elsewhere.

."We are a significant engine for the state's economy, and we intend to leverage the power of this engine to the greater benefit of Oregon in the years to come," Linton says. "We are working hard to assure that the necessary ingredients are in place to facilitate such progress." For example, the Riverfront Research Park in Eugene (see story) represents a long-term commitment to encourage the university and the Oregon business community to work together in research and development activities. The UO Office of Corporate and Foundation Relations (see story) links university talent, technologies or programs with businesses seeking mutually beneficial relationships through donations, student internships, collaborative research, and other forms of sponsorship.

."Taken together," Linton says, "the coordinated elements of the university described in this publication—cutting edge research programs, close R&D collaborations with Oregon businesses, and the associated infrastructure put in place to nurture those interactions—demonstrate the UO's commitment to making a difference in supporting a sustainable economic future for Oregon."

Back to INQUIRY home page

University of Oregon
Graduate School

Welcome to the University of Oregon Graduate School Web Site

Graduate Studies at the University of Oregon

Graduate Programs and Certificates

Prospective Students

Current Students

Faculty and Staff

We have designed our web site to provide information to both prospective and currently enrolled graduate students as well as members of the faculty and staff at the university.

If you are a prospective graduate student, we look forward to welcoming you to the University of Oregon. The Graduate School web site provides information for prospective graduate students regarding our more than 70 graduate programs, application procedures, and other information related to graduate education at the University of Oregon.

As a currently enrolled UO graduate student or a member of the faculty or staff, we hope that you find the information you are looking for on our web site. We have provided links to make it easy for you to find information regarding Graduate School academic procedures and policies, administrative information, funding resources, a calendar of events and workshops, and forms.

If you need additional information, please do not hesitate to contact the Graduate School staff at (541) 346-5129 or gradsch@uoregon.edu.

Modified 2-16-05

News and Events

OUS-SYLFF Graduate Fellowships for International Research

APRU Doctoral Student Conference

GTFF Collective Bargaining Agreement 2004-2006

GRADUATE SCHOOL
Graduate Degree Programs

Through the Graduate School, the University of Oregon offers studies leading to advanced degrees in the liberal arts and sciences and in the professional fields of architecture and allied arts, business, education, journalism and communication, and music. Program offerings are listed below with the degree offered (**M** = Master's; **D** = Doctoral) to the right of the major in the table below.

Specific program requirements for the majority of these degrees appear in the departmental web sites which are linked to the major names. The general requirements of the Graduate School are stated on the Graduate School Requirements web page.

The major schools and colleges offering advanced degrees at the university are:

- School of Architecture & Allied Arts
- College of Arts & Sciences
- Lundquist College of Business
- College of Education
- Graduate School: Interdisciplinary Programs
- School of Journalism & Communication
- School of Law
- School of Music
- Certificates

	School / College	Major Code	Major	Degree
UP				TOP
			School of Architecture and Allied Arts	
1.	AA	ARCH	Architecture	M
2.	AA	ART	Art	M
3.	AA	ARH	Art History	MD
4.	AA	AMGT	Arts Management	M
5.	AA	ARTC	Ceramics	M
6.	AA	CRP	Community & Regional Planning	M

7.	AA	ARTF	Fibers	M
8.	AA	HP	Historic Preservation	M
9.	AA	IARC	Interior Architecture	M
10.	AA	LA	Landscape Architecture	M
11.	AA	ARTM	Metalsmithing & Jewelry	M
12.	AA	ARTD	Multimedia Design	M
13.	AA	ARTP	Painting	M
14.	AA	ARTO	Photography	M
15.	AA	ARTR	Printmaking	M
16.	AA	PPM	Public Policy and Management	M
17.	AA	ARTS	Sculpture	M
18.	AA	ARTV	Visual Design	M
UP				TOP
College of Arts & Sciences				
19.	AS	ANTH	Anthropology	MD
20.	AS	APYH	Applied Physics	M
21.	AS	AST	Asian Studies	M
22.	AS	BI	Biology	MD
23.	AS	CH	Chemistry	MD
24.	AS	CLAS	Classics	M
25.	AS	COLT	Comparative Literature	MD
26.	AS	CIS	Computer & Information Science	MD
27.	AS	CWR	Creative Writing	M
28.	AS	EALL	East Asian Languages & Literatures	MD
29.	AS	EC	Economics	MD
30.	AS	ENG	English	MD
31.	AS	ENV	Environmental Studies	M
32.	AS	ESSP	Environmental Sciences, Studies, and Policy	D
33.	AS	FR	French	M
34.	AS	GEOG	Geography	MD

35.	AS	GEOL	Geological Sciences	MD
36.	AS	GER	German	MD
37.	AS	HIST	History	MD
38.	AS	HPHY	Human Physiology	MD
39.	AS	INTL	International Studies	M
40.	AS	ITAL	Italian	M
41.	AS	LING	Linguistics	MD
42.	AS	MATH	Mathematics	MD
43.	AS	PHIL	Philosophy	MD
44.	AS	PHYS	Physics	MD
45.	AS	PS	Political Science	MD
46.	AS	PSY	Psychology	MD
47.	AS	RL	Romance Languages	MD
48.	AS	R&ES	Russian and East European Studies	M
49.	AS	SOC	Sociology	MD
50.	AS	SE	Software Engineering	M
51.	AS	SPAN	Spanish	M
52.	AS	TA	Theater Arts	MD
UP				TOP

Charles H. Lundquist College of Business

53.	BA	ACTG	Accounting	MD
54.	BA	DSC	Decision Sciences	MD
55.	BA	DSCB	Decision Sciences: Business Statistics	MD
56.	BA	DSCP	Decision Sciences: Production & Operations Management	MD
57.	BA	FIN	Finance	MD
58.	BA	MGMT	Management	MD
59.	BA	MGB	Management: General Business (MBA)	M
60.	BA	MKTG	Marketing	MD
UP				TOP

College of Education

61.	ED	CDS	Communication Disorders & Sciences	MD
62.	ED	CFHS	Counseling, Family and Human Services	M
63.	ED	CPSY	Counseling Psychology	D
64.	ED	EINT	Early Intervention	MD
65.	ED	EDLD	Educational Leadership	MD
66.	ED	SPSY	School Psychology	MD
67.	ED	SPED	Special Education	MD
68.	ED	SPRH	Special Education: Rehabilitation	D
69.	ED	T&L	Teaching and Learning	M
UP				TOP
Graduate School				
70.	GR	IAIM	IS: Applied Information Management	M
71.	GR	IFLR	IS: Folklore	M
72.	GR	IIP	IS: Individualized Program	M
73.	GR	IT1	Teaching One Subject	M
UP				TOP
School of Journalism & Communication				
74.	JO	JCS	Communication and Society	MD
75.	JO	J	Journalism	M
76.	JO	JAD	Journalism: Advertising	M
77.	JO	JMAG	Journalism: Magazine	M
78.	JO	JNE	Journalism: News-Editorial	M
UP				TOP
School of Music				
79.	MU	DANC	Dance	M
80.	MU	IMT	Intermedia Music Technology	M
81.	MU	MCOM	Music Composition	MD
82.	MU	MCND	Music: Conducting	M
83.	MU	ME	Music Education	MD
84.	MU	MHIS	Music History	MD

85.	MU	MJS	Music: Jazz Studies	M
86.	MU	MUP	Music Performance	MD
87.	MU	MPP	Music: Piano Pedagogy	M
88.	MU	MTHE	Music Theory	MD
UP				TOP

CERTIFICATES

School of Architecture and Allied Arts

89.	AA	MSS	Museum Studies	GCERT
90.	AA	NFPM	Not-For-Profit Management	GCERT
91.	AA	TTA	Technical Teaching in Architecture	GCERT

College of Arts and Sciences

92.	AS	R&ES	Russian and East European Studies	GCERT
93.	AS	WST	Women and Gender Studies	GCERT
UP				TOP

College of Education

94.	ED	ECDS	Communication Disorders	GCERT
95.	ED	ESUP	Continuing Administrator/Superintendent	GCERT
96.	ED	EHL	Early Childhood/Elementary Special Education	GCERT
97.	ED	EEI	Early Intervention/Early Childhood Special Education	GCERT
98.	ED	EESO	English Speakers Other Language (ESOL)	GCERT
99.	ED	EESB	English Speakers Other Language/Bilingual	GCERT
100.	ED	EADM	Initial Administrator	GCERT
101.	ED	ITCH	Integrated Teaching	GCERT
102.	ED	MSED	Middle/Secondary Education	GCERT
103.	ED	ESHL	Middle/Secondary Special Education	GCERT
104.	ED	EMUS	Music Education	GCERT
105.	ED	ESPY	School Psychology	GCERT
106.	ED	EEC	Early Childhood	GCERT/ Inactive
107.	ED	EELM	Elementary	GCERT
108.	ED	ERET	Reading Education Teaching	GCERT/ Inactive

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This page is maintained by Richard F. Hadley, Computer Support Specialist for the Graduate School.

Last Update: February 8, 2005

materials science institute
University of Oregon

The Materials Science Institute is an interdisciplinary institute of the University of Oregon. Founded in 1985 as a State Center of Excellence, the purpose of the Institute is to study the structure and properties of materials, to educate in the sciences of materials, and to serve Oregon as a resource in these sciences. Since 1985 the Institute has more than tripled the size of its research program, developed four new graduate programs in materials, and contributed to the State's prosperity through collaboration with more than 25 Oregon companies.

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Internships

GK-12 Fellowship Program

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Faculty Profiles & Research Programs

News

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Chemistry Department

Physics Department

:: INDUSTRIAL OUTREACH

CAMCOR - Center for Advanced Materials Characterization in Oregon

Internships

Corporate Contact

MSI Retreat

Nobel Symposium

Contact Information:

Mailing Address:

Materials Science Institute

1252 University of Oregon

1371 E 13th St, Room 163

Willamette Hall

Eugene OR 97403

FAX:

(541) 346-3422

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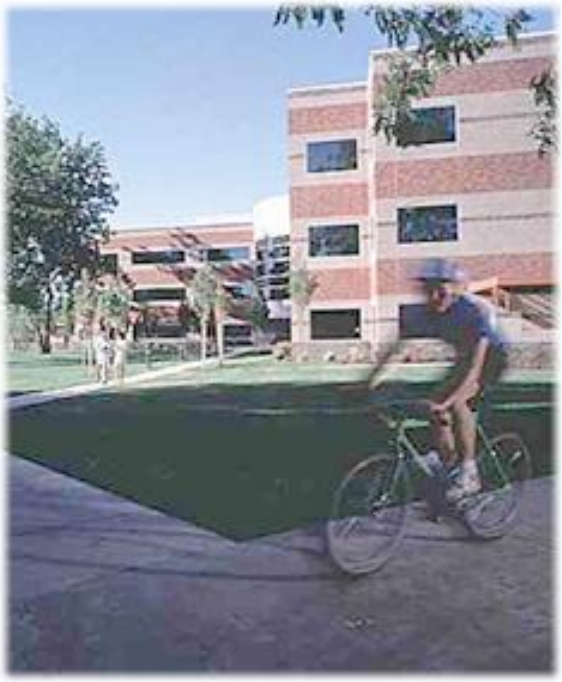
RIVERFRONT RESEARCH PARK



The dream of planting roots in a new frontier has been drawing adventurous people to Oregon for over 150 years. At the Riverfront Research Park, that spirit of exploration lives on today. In the same fertile, green valley where the Oregon Trail pioneers dreamed of new beginnings, leading-edge firms are putting down roots in the fields of artificial intelligence, biotechnology, neuroscience, behavioral research, software and web development, and networking products and solutions.

If your company is pushing the limits of research and development, or perhaps the bounds of your current space, consider that the destination point of the Oregon Trail is a fabulous take-off point for your new business frontier.

For additional information, please contact:
Riverfront Research Park Office
1276 University of Oregon
Eugene, Oregon 97403-1276
dwiley@uoregon.edu

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Only with gifts from friends and alumni can we preserve excellence at the University of Oregon. Our $600 million fundraising campaign will help the University of Oregon attract top students and professors, maintain premier facilities and continue groundbreaking research.

The future is our choice. We choose distinction.

January's gala event, *Lights, Camera ... Oregon!* kicked off Campaign Oregon with Hollywood star Fred Willard as Emcee, the Duck mascot in a tux and the announcement of two gifts that brought the campaign total to $316 million.

>> See Gala Photos

CAMPAIGN NEWS

- **$15-million Gift Announced At UO Gala**
- **Lokey pledges $2 million to School of Music's new building campaign**
- **$600-million fund-raising effort reaches halfway mark**

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INQUIRY

Fall 2001

Office Strengthens, Simplifies Cooperation Between University and Business

---

.The most direct way a corporation can learn about getting involved with the University of Oregon is to call Susan Plass, director of the Office of Corporate and Foundation Relations.

Susan Plass

."This office exists in part to make working with the university as efficient and successful as possible for corporations interested in reaching out and forming mutually beneficial partnerships," Plass says.

.Corporations are rewarded in these relationships in many forms, she explains, among them excellent public relations; access to the UO's world-class faculty, research and equipment; the skills of top-notch students; and an opportunity to benefit the state of Oregon as good corporate citizens.

."My interactions with corporations are really a two-way street," she explains. "Sometimes they are interested in offering surplus equipment or have an idea for an internship, or other such exchanges. Other times I think a UO program or a certain professor's work could be a good fit with the company's interests, and I'll talk with them about the opportunities that exist."

.The support companies provide usually falls into five categories: equipment donations, cash donations, in-kind services, internships, and special recruiting programs for UO graduates.

."These generous companies and foundations need to get something in return for their work with the UO‹and they most certainly do," she affirms.

.Plass stresses that when working with corporations flexibility is extremely important. She cites the UO's relationship with Sony Disc Manufacturing in Springfield as an example. In the past, UO requests for Sony support were "scattershot," she notes, coming from various parts of the university in no organized fashion and on no predictable schedule.

."Sony wanted to reorganize how they interacted with us. We agreed and have developed an annual partnership plan," she says.

.The plan focuses interactions with the UO on three areas of Sony's core industry interests: music (support for the Oregon Bach Festival, and UO School of Music); multimedia (as applied in both art and journalism); and computer science and technology training (involving the Department of Computer and Information Science, Campus Computing and the UO Library). The plan brings these units' requests together into one coherent document. Sony's management and philanthropy committee can then assess the various requests and decide which ones they would like to support and at what level.

."It works very well for all concerned," Plass says. "In the past two years they supported various UO programs in a variety of ways with a total value of about $170,000. Each request spells out explicitly not only what the UO hopes to receive, but also what Sony will get‹for example, public recognition and access to top students for internships."

.Sony is also pleased with the relationship.

."Sony Disc Manufacturing is proud to partner with the University of Oregon on so many levels. Working together, we can provide opportunities for students, teachers, and graduates to apply their knowledge and talents and ensure a healthy local economy for the long term," says Thomas Costabile, Sony's senior vice president for operations in Springfield.

."The flexibility goes in many directions," Plass says. "Some companies have formal giving programs; others operate in a more ad hoc fashion. I'm happy to work with them in whatever way they find best fits their corporate culture."

.Corporate and foundation support for university activities has grown ever more crucial in the wake of Oregon's property tax limitation measures.

."It is an exciting and rewarding challenge to help build bridges between the university and Oregon's business community,"says Plass, who was hired to establish the program in 1997. "Our program is young, and I see the possibility of many new mutually beneficial partnerships developing in the future between UO and Oregon companies."

Back to INQUIRY home page

OREGON BACH FESTIVAL

UNIVERSITY OF OREGON

HELMUTH RILLING, Artistic Director and Conductor ■ JUNE 23 - JULY 10, 2005 EUGENE, OREGON

The Youth Choral Academy, under the direction of Anton Armstrong, is an intensive program for high school singers.

ABOUT US

Helmuth Rilling, artistic director and conductor, leads two weeks of choral-orchestral concerts centering on the music and wide-ranging influence of J.S. Bach. Set amid the lush forests and scenic rivers of Eugene and the Willamette Valley, the festival also includes chamber music, family events, and educational programs in "a musical enterprise virtually without equal in America." (LA Times)

Welcome to oregonbachfestival.com

You're Invited to Bach Night
Join us for our season preview, a guided tour of the 2005 Festival with audio and video clips, ticket ordering, refreshments and prizes. It's March 22 at 7 pm in the Downtown Athletic Club in Eugene (preceded by our Friends of the Festival annual meeting at 6 pm). Call (541) 346-5666 or write to find out more.

See Rilling in Seattle
Festival artistic director Helmuth Rilling conducts Elijah with the Seattle Symphony April 15. The Friends of the Festival and the University of Oregon have arranged a special group discount and reception. To attend with our group, call (800) 457-1486 and ask for Ann, or send us an email.

Oregon Bach Festival 2005
Coming June 23-July 10: the northwest US premiere of La Pasion Segun San Marcos by Osvaldo Golijov, the American premiere of The Uncle From Boston (a comic opera by Mendelssohn), Bach's Christmas Oratorio, and the first Festival appearance by the Kronos Quartet, and 50 total events. Ticket orders accepted March 22.

Festival News

Two Premieres Headline '05 Festival
Bach's abuzz about a Latino Passion and a rediscovered opera

La Pasión Returns to its Birthplace
Grown from a relationship started in Eugene, Osvaldo Golijov's fiery Latino Pasión opens the 2005 Festival.

Rilling Brings Mendelssohn's Lost Uncle to America
An accomplished comic opera—composed by Mendelssohn at age 14—is rediscovered and gets its American premiere this summer in Eugene.

More...

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Updated January 11, 2005

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Fax: 541/346-5669
bachfest@darkwing.uoregon.edu

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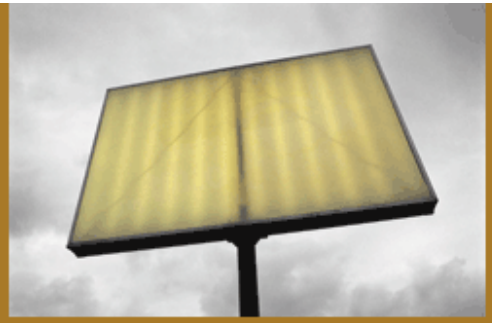

UNIVERSITY OF OREGON

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What's New?

Anonymous donor funds Portland center, scholarships

LSDT Online

Payne Awards for Ethics in Journalism -- nominations due February 25th

2005 Johnston Lecture announced

2005 Ruhl Lecture announced

Bryce Zabel, '76, produces "Lights, Camera, Oregon" campaign kickoff event

SOJC to host Colloquium 2005 in Applied Media Ethics

Prospective students
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Faculty/Staff/Student Email Access

Copywriter Dana Valikai (left) and Co-Creative Director Andrew MacKenzie of Allen Hall Advertising work on developing concepts for television, radio and print advertising for the upcoming Governor's Campaign Against Methamphetamine Abuse. Since 1983, Allen Hall Advertising, a student-run advertising agency, has provided advertising services for clients on and off campus. Recent clients include the Lundquist College of Business New Venture Competition, the US Forest Service, Digital Duck and Ironworks Gym. Hands-on experience is guaranteed.

Photo by Laura Taylor, undergraduate student.

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Featured Link:

Summer Journalism workshop for Minority High School Students

Electronic Media students prepare to go live with Oregon News. Read more...

Roger Fidler '66 talks with Elisa Johnston at the School's Hall of Achievement Breakfast. Read more...

Students gather at the Hall of Achievement Event. Read more...

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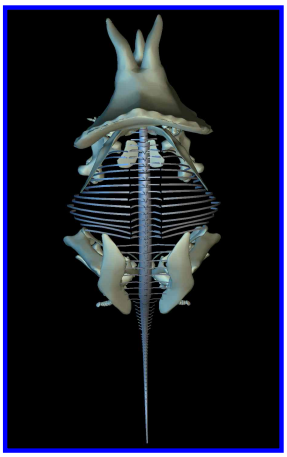

Bioinformatics Research Published in *Nature*


CIS graduate student, Bryan Kolaczkowski, and UO assistant professor of biology, Joe Thornton, used a small supercomputer to simulate the evolution of thousands of gene sequences on a hypothetical evolutionary tree. (cont.)

Colloquium Honors Work of Prof. Andrzej Proskurowski


The Department recently hosted a special Colloquium honoring CIS theory faculty Dr. Andrzej Proskurowski on the occasion of his birthday. (cont.)

Welcome to New AI Faculty Dejing Dou


The CIS department welcomes our newest faculty member, Assistant Professor Dejing Dou, whose research focuses on practical as well as theoretical aspects of Artificial Intelligence, Databases, Biomedical Informatics and the Semantic Web. (cont.)

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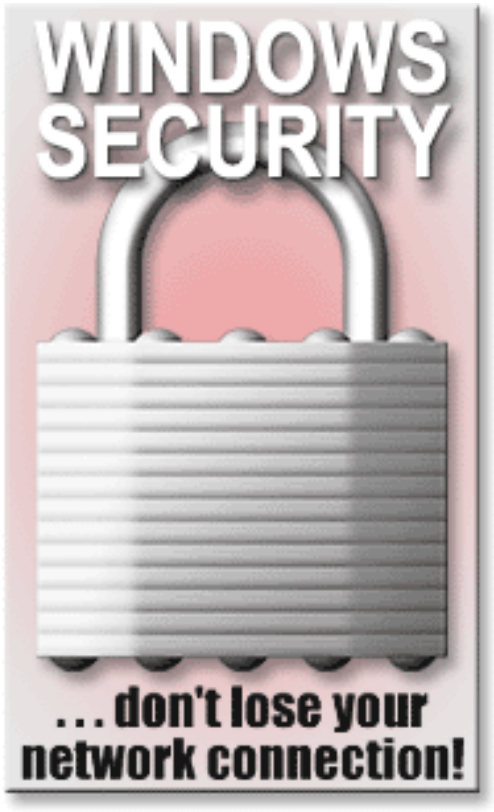

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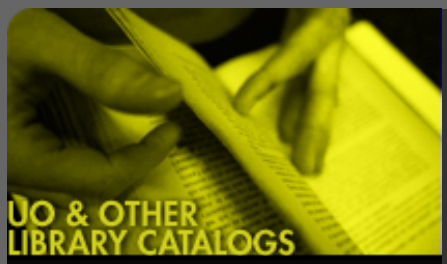

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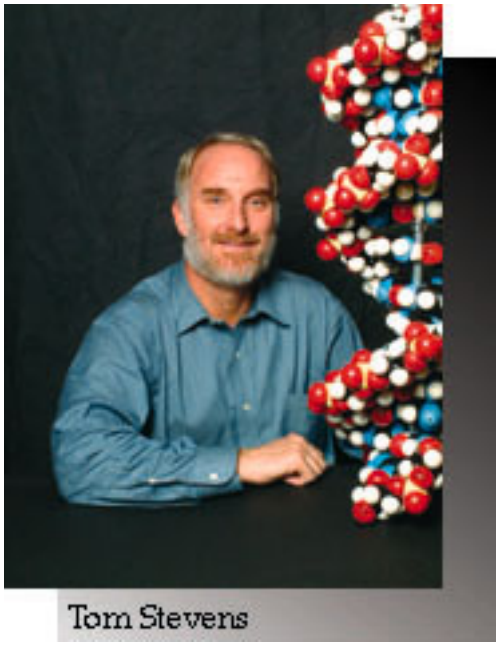
INQUIRY

Fall 2001

Biosciences Thriving at UO

Working for a healthier world

.For several years headlines have trumpeted the work of DNA researchers as they have made one advance after another in the long march toward mapping and sequencing the 30,000 genes now believed to make up the human genome. Achieving that goal marked a milestone in the history of science. The next great advance in understanding how humans function—and how some of our most deadly diseases may be stopped—will likely be a natural extension of this work and take place in the closely related disciplines of genomics and proteomics.


Tom Stevens

."Genomics and proteomics are the yin and yang of twenty-first century biomedical science," says Tom Stevens, a UO professor of chemistry and the director of the Institute of Molecular Biology. "Using our knowledge of both of them together we can come to a very advanced understanding of the whole organism."

.Not only has the burst of research in the area of genomics yielded the genetic blueprint for humans, it has also led to the sequencing of genomes for important model species used extensively in biomedical research (for example yeast, fruit fly, worm, zebrafish, and mouse). The genomes of additional organisms are being sequenced at an increasing pace.

."Now we are exploring further, we are finding out how the elements detected in the genome of a given species affect the development and health of members of that species. That is the heart of genomics and proteomics," Stevens says. "And UO researchers are focusing a lot of attention on this area. We're working hard to develop a first-class genomics and proteomics facility here on campus."

.One of the key contributors to this research effort at UO is biologist Roderick Capaldi, whose laboratory is at the forefront of one promising and rapidly advancing frontier of biomedical research.

."Our work is focused on basic questions of how cells function—specifically, how they make energy and use it," Capaldi says.

.The energy production powerhouses in cells are called mitochondria. Mutations of the DNA inside mitochondria are believed to cause a variety of severe ailments, such as neurodegenerative disease, Parkinson's, and Alzheimer's.

.Doctors have long studied these devastating diseases, but only now are researchers discovering links between the maladies and mitochondrial malfunction. Advances made in Capaldi's laboratory have caught the attention of a San Diego-based pharmaceutical company, MitoKor, with which the university has entered into a licensing agreement. MitoKor will now develop clinical and therapeutic applications based on the discoveries made in Capaldi's laboratory together with the contributions of several other academic research groups.

.Capaldi is one of about twenty professors who are members of the Institute of Molecular Biology, the area where much of the genomics and proteomics work at the UO is centered (another dozen researchers are conducting closely related genomic research). Stevens says that the group will likely benefit from the recent hiring of half a dozen extremely talented researchers.

."Our new faculty members are on the forefront of functional genomic and proteomic analysis and will be playing a central role as we make an increasingly large contribution to biomedical understanding," Stevens says.

.He adds that the new faculty will complement the expertise of the existing faculty and help create a critical mass of research capability likely to lead to further advances.

."The level of complexity at which we are understanding development is truly amazing," he says. "We now have a 'whole organism' view of how the interconnections of life work out. I expect to see this result in a revolution in patient care in the treatment of cancer, AIDS, and other diseases. This is only the tip of the iceberg."

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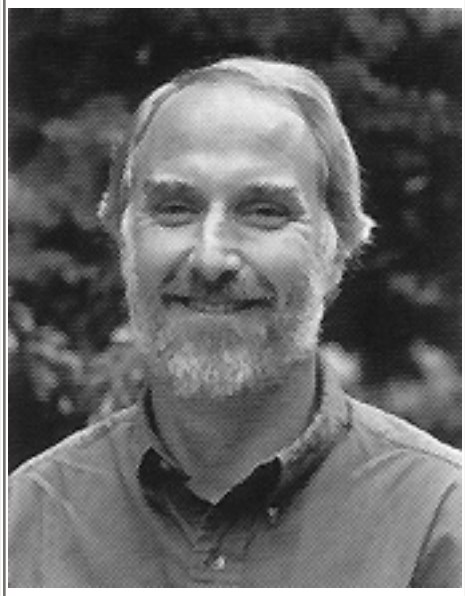
UNIVERSITY OF OREGON
INSTITUTE OF MOLECULAR BIOLOGY

Tom Stevens



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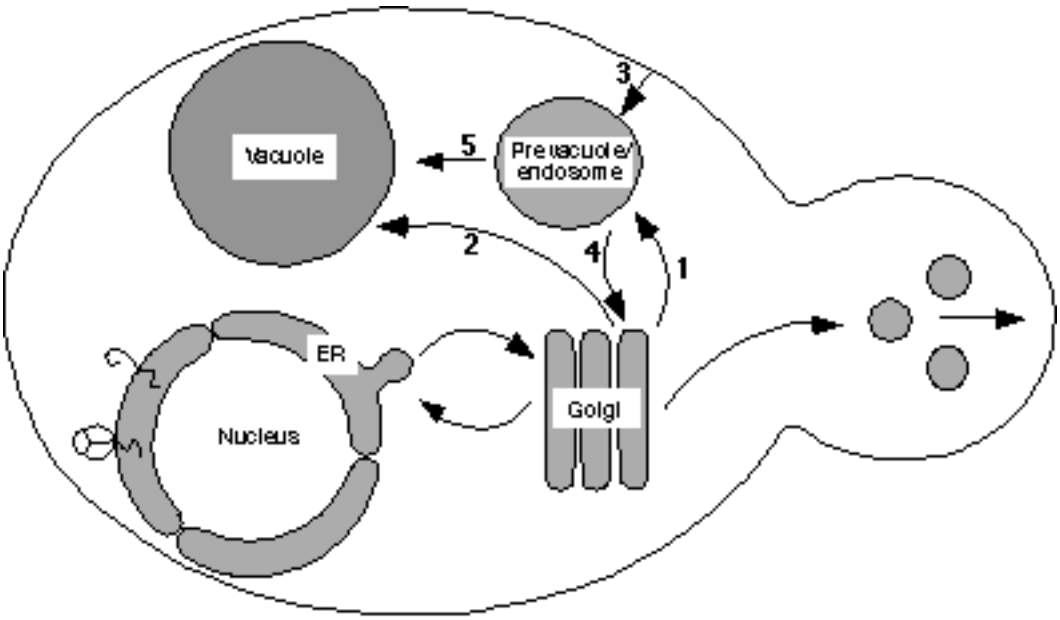
Research Interests

We are concerned with the process of protein sorting and membrane organelle assembly in yeast cells. Yeast molecular genetics has allowed the researchers to identify a large number of genes required for the correct targeting and transport of proteins to the organelle called the vacuole, and these vacuolar protein sorting (*VPS*) genes have been found to encode proteins such as a dynamin-like GTPase, a protein sorting receptor, a protein kinase, a lipid kinase, a RAS inhibitor-like protein, and an increasingly large number of proteins involved in transport vesicle targeting/fusion such as Rab-like GTPases, Sec1-like and syntaxin-like proteins. To characterize the function of some of these proteins the group uses biochemical, cell biological and molecular genetic approaches. Biochemical approaches are being used to isolate a number of the VPs proteins and to study the membrane-associated protein complexes in which they are found.

Investigations into the mechanism of targeting integral membrane proteins in yeast has led to the discovery of a short peptide stretch rich in aromatic amino acids that functions to retain membrane proteins within the Golgi compartment. These aromatic amino acid-rich motifs are found in the cytosolic domains of these proteins, and have been found to function in retrieval of these proteins after they

have been transported to a post-Golgi compartment. This work has now led to the isolation of a group of yeast genes involved in the process of Golgi membrane protein retention and receptor recycling. Among the genes identified, one is likely to encode a receptor that binds to the aromatic amino acid-rich Golgi retention signal and regulate the retrieval process.

The group also has a long-standing interest in the assembly, targeting, and function of the vacuolar H+-translocating ATPase (V-ATPase). Having cloned and characterized most of the subunit encoding genes (13 subunit genes), the group has now turned its focus to understanding how this protein is assembled and targeted to the vacuole. Several genes have been identified and characterized that encode proteins required for V-ATPase complex assembly but are not themselves part of the final V-ATPase enzyme complex. The group is currently characterizing three proteins, Vma12p, Vma21p and Vma22p, that are localized to the endoplasmic reticulum (ER) membrane and function in the V-ATPase assembly process. Cross linking and density sedimentation experiments indicate that the Vma12/21/22 protein complex interacts with integral membrane subunits of the V-ATPase during the assembly of this large complex in the ER. Once assembled, the V-ATPase complex is transported from the ER to the Golgi complex and then on to the vacuole.



Schematic drawing of the yeast endomembrane pathways. Proteins exiting the Golgi complex can be transported by either the CPY pathway (arrow 1) through the prevacuole to the vacuole, or by the ALP pathway (arrow 2). Proteins can also reach the prevacuole by endocytosis (arrow 3), and proteins in the prevacuole transit a common pathway to the vacuole (arrow 5). Golgi membrane proteins such as DPAP A are retrieved from the prevacuole back to the Golgi (arrow 4).

Selected Publications

Bowman E.J., L.A. Graham, T.H. Stevens, and B.J. Bowman (2004) The bafilomycin/concanamycin binding site in subunit c of the V-ATPases from *Neurospora crassa* and *Saccharomyces cerevisiae*. J Biol Chem **279**:33131-8.

Malkus P., L.A. Graham, T.H. Stevens, and R. Schekman (2004) Role of vma21p in assembly and transport of the yeast vacuolar ATPase. Mol Biol Cell **15**:5075-91.

Flannery A.R., L.A. Graham, and T.H. Stevens (2004) Topological characterization of the c, c', and c" subunits of the vacuolar ATPase from the yeast Saccharomyces cerevisiae. J Biol Chem **279**:39856-62.

Graham L.A., A.R. Flannery, and T.H. Stevens (2003) Structure and assembly of the yeast V-ATPase. J Bioenerg Biomembr **35**:301-12.

Kweon Y., A. Rothe, E. Conibear, and T.H. Stevens (2003) Ykt6p Is a Multifunctional Yeast R-SNARE That Is Required for Multiple Membrane Transport Pathways to the Vacuole. Mol Biol Cell **14**:1868-81.

Conibear E., J.N. Cleck, and T.H. Stevens (2003) Links Vps51p mediates the association of the GARP (Vps52/53/54) complex with the late Golgi t-SNARE Tlg1p. Mol Biol Cell **14**:1610-23.

Conibear E. and T.H. Stevens (2002) Studying yeast vacuoles. Methods Enzymol. **351**:408-32.

Kawasaki-Nishi S., K. Bowers, T. Nishi, M. Forgac, and T.H. Stevens (2001) The amino-terminal domain of the vacuolar proton-translocating ATPase a subunit controls targeting and *in vivo* dissociation, and the carboxyl-terminal domain affects coupling of proton transport and ATP hydrolysis. J Biol Chem **276(50)**:47411-20.

Sagermann, M., T.H. Stevens, and B.W. Matthews (2001) Crystal structure of the regulatory subunit H of the V-type ATPase of *Saccharomyces cerevisiae*. PNAS **98 (13)**:7134-9.

Gerrard, S.R., A.B. Mecklem, and T.H. Stevens (2000) The yeast endosomal t-SNARE, Pep12p, functions in the absence of its transmembrane domain. Traffic **1 (1)**:45-55.

Conibear E. and T..H. Stevens (2000) Vps52p, Vps53p and Vps54p forms a novel multisubunit complex required for protein sorting at the yeast late Golgi. Mol Biol Cell **11(1)**:305-23.

Graham, L.A., B. Powell, and T.H. Stevens (2000) Composition and assembly of the yeast vacuolar H+-ATPase complex. J Exp Biol **203**:61-70.

Gerrard, S.R., N.J. Bryant, and T.H. Stevens (2000) Vps21 controls entry of endocytosed and biosynthetic proteins into the yeast prevacuolar compartment. Mol Biol Cell **11(2)**:613-26.

Gerrard, S.R., B.P. Levi, and T.H. Stevens (2000) Pep12p is a multifunctional yeast syntaxin that controls entry of biosynthetic endocytic and retrograde traffic into the prevacuolar compartment. Traffic **1(3)**:259-69.

Powell, B., L.A. Graham, and T.H. Stevens (2000) Molecular characterization of the yeast vacuolar H+-ATPase proton pore. J Biol Chem. **275(31)**:23654-60.

Bowers, K., B.P. Levi, F.I. Patel, and T.H. Stevens (2000) The sodium/proton exchanger Nhx1p is required for endosomal protein trafficking in the yeast *Saccharomyces cerevisiae*. Mol Biol Cell **11(12)**:4277-94.

Ungermann, C., G. Fischer von Mollard, O.N. Jensen, N. Margolis, T.H. Stevens, and W. Wickner (1999) Three v-SNAREs and two t-SNAREs are essential for homotypic vacuole fusion. J Cell Biol **145**:1435-42.

Zheng, H., G. Fischer von Mollard, V. Kovaleva, T.H. Stevens, and N.V. Raikhel (1999) The Plant v-SNARE AtVTI1a Likely Mediates Vesicle Transport from the TGN to the Prevacuole. Mol Biol Cell **10**:2251-64.

Fischer von Mollard, G. and T.H. Stevens (1999) The *Saccharomyces cerevisiae*: v-SNARE Vti1p is required for multiple transport pathways to the vacuole. Mol Biol Cell **10**:1719-32.

Graham, L.A. and T.H. Stevens (1999) Assembly of the yeast vacuolar proton-translocating ATPase. J Bioener and Biomem **31**:39-47.

Conibear, E. and T.H. Stevens (1998) Multiple sorting pathways between the late Golgi and the vacuole in yeast. Biochim Biophys Acta **1404**:211-30.

Bryant, N.J., R.C. Piper, L.S. Weisman, and T.H. Stevens (1998) Retrograde traffic out of the yeast vacuole to the TGN occurs via the prevacuolar/endosomal compartment. J Cell Biol **142**:651-63.

Graham, L.A., K.J. Hill, and T.H. Stevens (1998) Assembly of the yeast vacuolar H+-

ATPase occurs in the endoplasmic reticulum and requires a Vma12p/Vma22p assembly complex. J Cell Biol **142**:39-49.

Bryant, N.J., R.C. Piper, S.R. Gerrard, and T.H. Stevens (1998) Traffic into the prevacuolar/endosomal compartment of *Saccharomyces cerevisiae*: a VPS45-dependent intracellular route and a VPS45-independent, endocytic route. Eur J Cell Biol **76**:43-52.

Fischer von Mollard, G. and T.H. Stevens (1998) A human homologue can functionally replace the yeast v-SNARE Vti1p in two vesicle transport pathways. J Biol Chem **273**:2624-30.

Voos, W. and T.H. Stevens (1998) Retrieval of resident late-Golgi membrane proteins from the prevacuolar compartment of *Saccharomyces cerevisiae* is dependent on the function of Grd19p. J Cell Biol **140**:577-90.

Bryant, N.J. and T.H. Stevens (1998) Vacuole biogenesis in *Saccharomyces cerevisiae*: protein transport pathways to the yeast vacuole. Microbiol and Molec Biol Rev 230-47.

Jackson, D.D. and T.H. Stevens (1997) VMA12 encodes a yeast endoplasmic reticulum protein required for vacuolar H+-ATPase assembly. J Biol Chem **272**:25928-34.

Tomashek, J.J., L.A. Graham, M.U. Hutchins, T.H. Stevens, and D.J. Klionsky (1997) V1-situated stalk subunits of the yeast vacuolar proton-translocating ATPase. J Biol Chem **272**:26787-93.

Stevens, T.H. and M. Forgac (1997) Structure, function and regulation of the vacuolar H+-ATPases. Ann Rev Cell and Devel Biol **13**:779-808.

Piper, R.C., N.J. Bryant, and T.H. Stevens (1997) The membrane protein alkaline phosphatase is delivered to the vacuole by a route that is distinct from the VPS-dependent pathway. J Cell Biol **138**:531-45.

Fischer von Mollard, G., S.F. Nothwehr, and T.H. Stevens (1997) The yeast v-SNARE mediates two vesicle transport pathways through interactions with the t-SNAREs Sed5p and Pep12p. J Cell Biol **137**:1511-24.

Tellam, J.T., D.E. James, T.H. Stevens, and R.C. Piper (1997) Identification of a mammalian Golgi Sec1p-like protein; mVps45p. J Biol Chem **272**:6187-93.

Bryant, N.J. and T.H. Stevens (1997) Two separate signals act independently to localize a yeast late-Golgi membrane protein through a combination of retrieval and static retention. J Cell Biol **136**:287-97.

Hirata, R., L.A. Graham, A. Takatsuki, T.H. Stevens, and Y. Anraku (1997) VMA11 and VMA16 encode the second and third proteolipid subunits of the *Saccharomyces cerevisiae* vacuolar membrane H+-ATPase. J Biol Chem **272**:4795-803.

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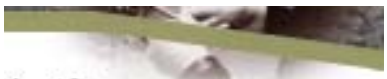

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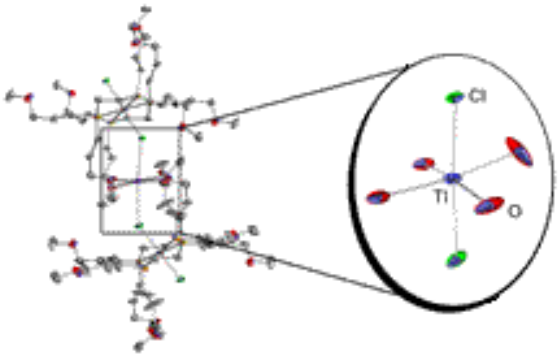

UO Lab Discovers Method to Assemble 1-D Coordination Polymers

Researchers in the Tyler lab recently demonstrated how "arrested" chloride abstraction reactions can be used to assemble 1-D coordination polymers.
PDF: Arrested chloride abstraction from trans-$RuCl_2(DMeOPrPE)_2$ with $TlPF_6$; formation of a 1-D coordination polymer having unusual octahedral coordination around Thallium(I). Nathaniel K. Szymczak, Fusen Han and David R. Tyler, Dalton Transactions, 2004, 3941 - 3942.
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Development of the Zebrafish Database is generously supported by the NIH (P41 HG002659).

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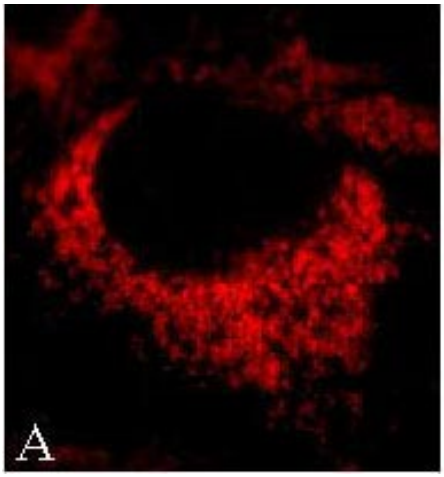
THE MITOCHONDRION PROJECT

The mitochondrial research project at the University of Oregon involves several laboratories and encompasses studies of structure, function and pathology of this organelle. The MORPHOLOGY AND CELLULAR ARRANGEMENT of mitochondria in several human cell lines is being studied using fluorescence microscopy. Mitochondria are "labeled" with Mitotraker, or by genetically-targeted GFP. Cell cycle dependent changes in mitochondrial morphology have been identified.



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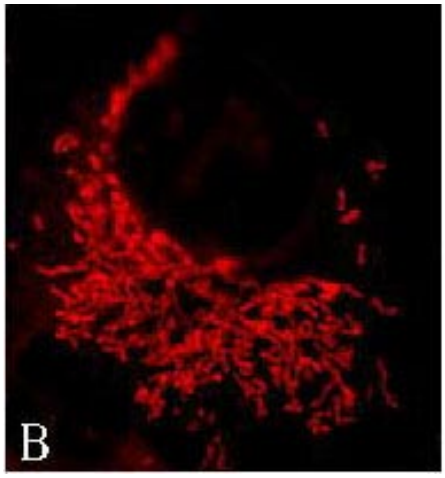

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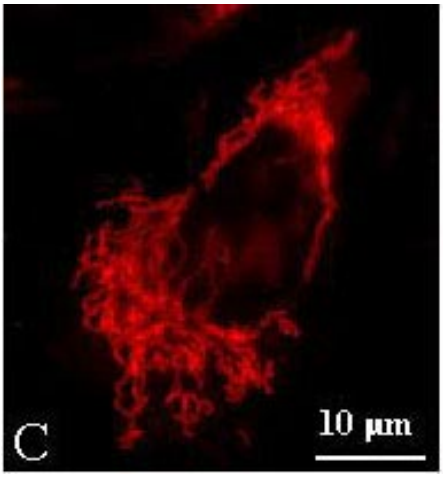

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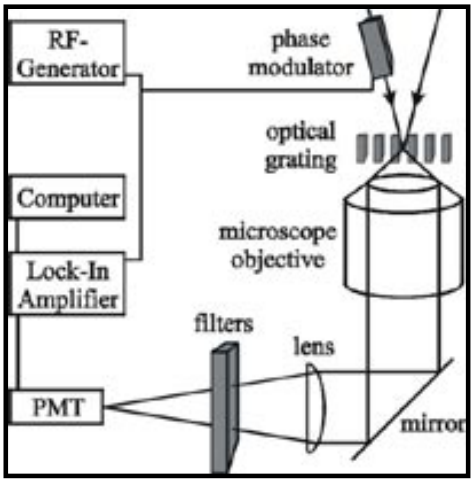
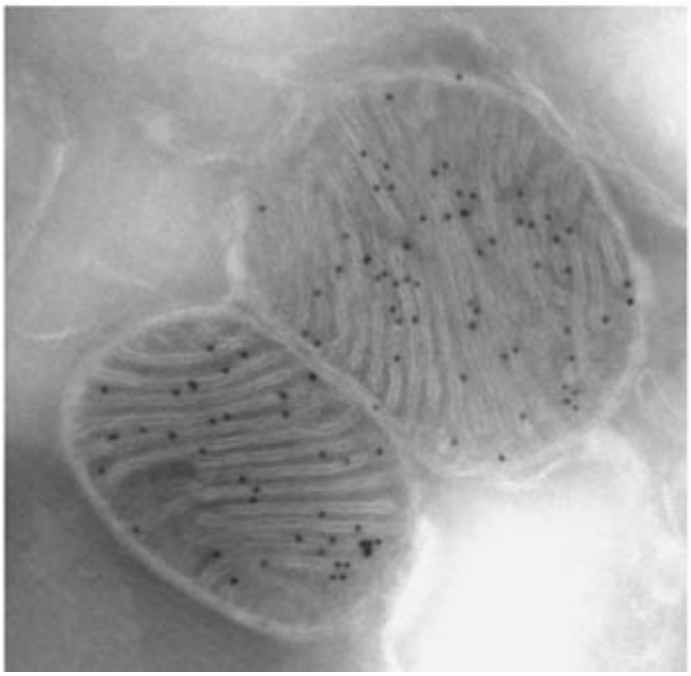


Movements of the organelle within the cell in response to extracellular and intracellular signals are being examined by digital fluorescence microscopy and by a novel technique of fourier imaging correlation spectroscopy (FICS) that has been developed recently in the laboratory of Dr. Andrew Marcus (Chemistry).

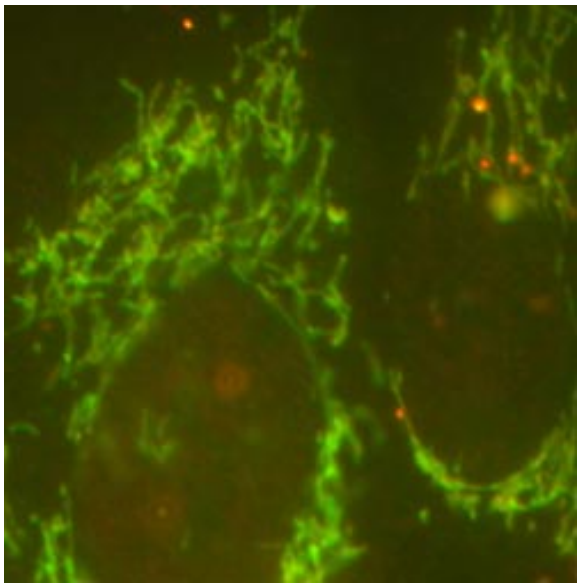
The INTERNAL STRUCTURE of mitochondria is being studied by Dr. Jeanne Selker and colleagues using a variety of electron microscopy techniques. In particular, the distribution of proteins to different compartments in the cell e.g. outer membrane, inner membrane, cristal membrane, inter-membrane space and matrix space is being examined by

immunological approaches employing gold labeled monoclonal antibodies.



Distribution of the cytochrome bc1 complex revealed by immunogold labeling of bovine heart ultrathin cryosections

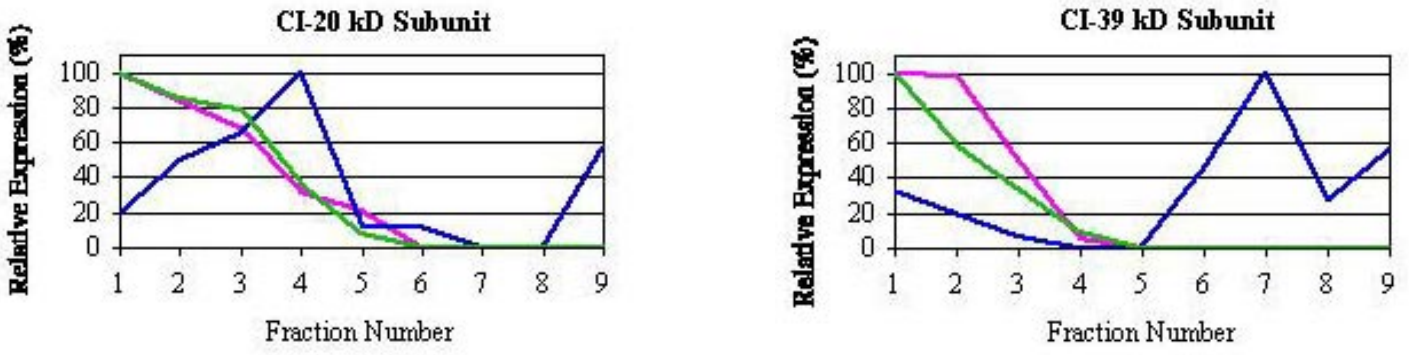
It is becoming clear that there is only limited diffusion of proteins, DNA and RNA's within the organelle. FICS is now being used along with video microscopy to determine movements within mitochondria when in the reticulum form.



As yet the TOTAL PROTEIN COMPOSITION of mitochondria is poorly defined. More than 150 proteins of the mitochondrion are known, but estimates suggest that the organelle includes in excess of 1000 different polypeptides, of which 13 are coded on mtDNA with the rest of nuclear/cytosolic origin. We have begun an effort to identify all components in human heart and human fibroblast mitochondria. This proteomics effort is a collaboration with Molecular Probes (Eugene). As novel proteins are identified, they are being overexpressed, purified and monoclonal antibodies made to each to aid in the structural studies described above.

Mitochondria labeled with a mAb against pyruvate dehydrogenase E2 subunit that has been conjugated directly with Alexa 488.

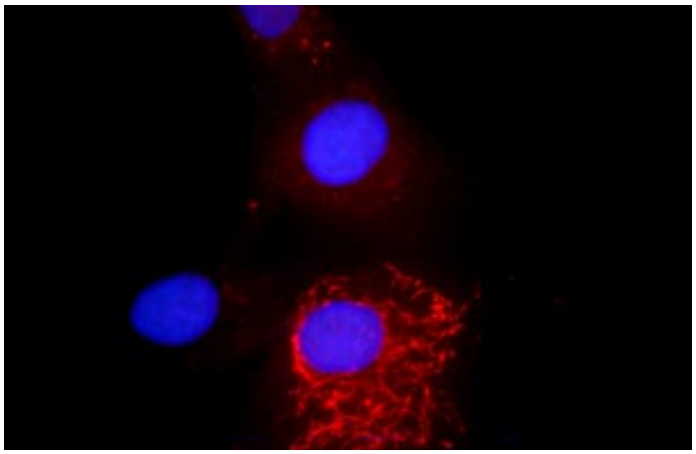
The monoclonal antibodies produced by Dr. Michael Marusich and colleagues are an important tool in examining the PATHOLOGY OF MITOCHONDRIA. There are a number of diseases caused by a primary defect in a component of mitochondria.



Mitochondria from a control cell line (green) and two cell lines from patients with Complex I (CI) deficiencies (blue and pink) were separated on a sucrose gradients. The positions in the gradient of a CI-20kD subunit and a CI-39kD subunit were determined by Western blotting and plotted. While CI assembly appears to unaffected in one patient (pink), it is clearly altered in the other patient (blue).

Additionally, many medical conditions cause altered energy metabolism by secondarily altering mitochondrial function. Also, this organelle is a critical player in programmed cell death or apoptosis. Diagnosis of mitochondrial diseases, and characterization of the changes in mitochondrial structure and functions as a secondary consequence of other diseases, remains difficult. Our collection of monoclonal antibodies listed below are useful in such studies.

In vivo tests of MITOCHONDRIAL FUNCTIONING are few. We have available through a collaboration with Dr. J Remington (Physics), two GFP mutants engineered to measure redox state and proton concentration respectively. These have been successfully targeted to mitochondria in normal and patient cell lines. Both reporters are ratiometric so that there is no concentration dependence of the signal. Free radical production and pH changes as a function of respiration and ATP synthesis in normal and altered cells are now being examined.



Immunohistochemical cellular mosaicism of mtDNA-encoded proteins is a diagnostic characteristic of mtDNA-depletion sydrome. Red = cytochrome *c* oxidase subunit I. Blue = nuclei. Some cells express apparently normal levels of mitochondrial COX-I, while other cells lack detectable COX-I.
For details, see Marusich, et al., (1997) *Biochem. Biophys. Acta*, 1362, 145-159.

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Bonnie Hanson, Graduate Student


Jitka Tomanova, Graduate Student


Beth Monika, Research Assistant


Linda Sundell, Visiting Scientist


Robert Gilkerson, Graduate Student


Devin Ogelsbee, Graduate Student


Kathy Chicas-Cruz, Research Assistant


Andrew Marcus, Asst. Professor of Chemistry


Michael Marusich, Dir. Monoclonal Antibody Facility

Rodrigue Rossignol, Post Doctoral Student
Michelle Knowles, Graduate Student
Beth Prescott, Research Assistant
Jerry Bentze, Research Assistant
Juliana Coons, Graduate Student
Jeanne Selker, Senior Research Associate

RECENT PUBLICATIONS

Margineantu, D.H., R.A. Capaldi, and A.H. Marcus. (2000) Dynamics of the mitochondrial reticulum in live cellls using patterned fluorescence correlation spectroscopy and digital video microscopy. *Biophys. J.* 79, 1833.

Gilkerson, R.W., D.H. Margineantu, R.A. Capaldi, and J.M.L. Selker. (2000) MtDNA depletion causes morphological changes in the mitochonrial reticulum of cultured human cells. *FEBS Lett.* 474, 1.

Capaldi, R.A. (2000) The changing face of mitochondrial research. *Trends in Biochem Sci.* 25, 212.

Garcia, J.J., I. Ogilvie, B.H. Robinson, and R.A. Capaldi. (2000) Structure functioning and assembly of the ATP syntase in cells from patients with the T8993G mitochondrial DNA mutation. Comparison with the enzyme in Rho cell completely lacking mtDNA. *J. Biol. Chem.* 275, 11075.

Rahman, S. J.W. Taanman, J.M. Cooper, I. Nelson, I. Hargreaves, B. Meunier, MG. Hanna, J.J. Garcia, R. A. Capaldi, B.D. Lake, J.V. Leonard, and H.V. Schapira. (1999) A missense mutation of cytochrome oxidase subunit II causes defective assembly and myopathy. *Am J. Human Genetics* 65, 1030-1039.

Taanman, J.W., M.D. Burton, M.F. Marusich, N.G. Kennaway, and R.A. Capaldi. (1996) Subunit specific monoclonal antibodies show different steady-state levels of various cytchrome *c* oxidase subunits in chronic progressive opthalmoplegia. *Biochem. Biophys. Acta* 1315, 199-207.

ANTIBODY LIST

Antigen	MAb	MW on SDS-Page	Antibody Isotype	Human XR	Rat XR	Bovine XR
C-I						
C-I-08	RAC#24-17C8E4E11	08 kD	IgG1,k	+	+	+
C-I-14 NDUFS5	RAC#24-21A6BE1BA3AD1	15 kD	IgG1,k	+	-	+
C-I-15	RAC#24-17G3D9E12	15 kD	IgG1,k	+	+/-	+
C-I-18	RAC#24A-22B8BE8H5	18 kD	IgG1,k	+	nd	+
C-I-20	RAC#24A-20E9DH10C12	20 kD	IgG1,k	+	nd	+
C-I-30 NDUFS3	RAC#24A-17D950C9H11	30 kD	IgG2a,k	+	nd	+
C-I-39 NDUFS2L	*RAC#24-20C11B11B11	39 kD	IgG1,k	+	+	+
C-II						
C-II-30 (FeS)	*RAC#23-21A11AE7	30 kD	IgG2a,k	+	+	+
C-II-70 (FL)	*RAC-#23-2E3GC12FB2AE2	70 kD	IgG1,k	+	+	+
C-III						

C-III-Core 2	*RAC-#23-13G12AF12BB11	45 kD	IgG1,k	+	+	+
C-IV						
C-IV-1	*RAC#18-1D6E1A8	40 kD	IgG2a,k	+	+	+
C-IV-2	*RAC#21-12C4F12	24 kD	IgG2a,k	+	-	+/-
C-IV-2	RAC#21-15B4C1	24 kD	IgG	+/-	-	+
C-IV-4	*RAC#11-20E8C12	17 kD	IgG2a,k	+	+	+
C-IV-4	*RAC#4-10G8D12C12	17 kD	IgG2a,k	+	-	+
C-IV-5a	RAC#1-6E9B12D5	08 kD	IgG2a,k	+	+/-	+
C-IV-5b	*RAC#7-16H12H9	08 kD	IgG2b,k	+	+	+
C-IV-6aH	*RAC#7-4H2A5	06 kD	IgG2a,k	+/-	-	+
C-IV-6aL	*RAC#15-14A3AD2BH4	06 kD	IgG1,k	+/-	+/-	+
C-IV-6b	RAC#10-8F2E3G10	06 kD	IgG2a	-	-	+
C-IV-6c	*RAC#10-3G5F7G3	06 kD	IgG2b,k	+	+	+
C-IV-7aHL	RAC#10-6D7G8E5	05 kD	IgG2a	+	+	+
C-IV-7b-VIIb	RAC#3-2G7H8R	05 kD		+/-	-	+
C-V						
C-V-Alpha	*MM#1-7H10BD4	53 kD	IgG2b,k	+	+	+
C-V-Alpha (plant XR)	MM#1B-15H4C4	53 kD		+	nd	nd
C-V-Beta	RAC#5-7E3F2	52 kD	IgG2a	+	+	+
C-V-IF1	RAC#25A-5E2D7	8 kD	IgG1,k	+	+	+
C-V-d	*MM#1-7F9BG1	29 kD	IgG2b,k	+	nd	+
PDH						
PDH-E1-B	MM#3-17A5E2H8	35 kD	IgG1,k	+	+	nd
PDH-E2	MM#3-15D3G9C11	72 kD	IgG1,k	+	-	nd
PDH-E2/E3bp	MM#3-13G2AE2BH5	72/55	IgG2a,k	+	nd	nd

NOTE: "Heat" for immunocytochemistry indicates that paraformaldehyde-fixed target cells must be treated for 20 min at 90 C in 0.1M Tris/HCl pH 9.5 with 5% urea before acetone permeabilization.
***Available through Molecular Probes Inc.**

POSITION OPENINGS

A post-doctoral position is available to work on structural aspects of mitochondria, using fluorescence microscopy of GFP-tagged mitochondrae proteins.

Inquiries, contact:

- **Regular Mail:**
  R.A. Capaldi
  1229 University of Oregon
  Eugene, OR 97403-1229
- **E-mail:** rcapaldi@oregon.uoregon.edu
- **Telephone:** 541-346-5881
- **Fax:** 541-346-4854

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Updated: January 2000
Contact: webmaster@molbio.uoregon.edu

INQUIRY

Fall 2001

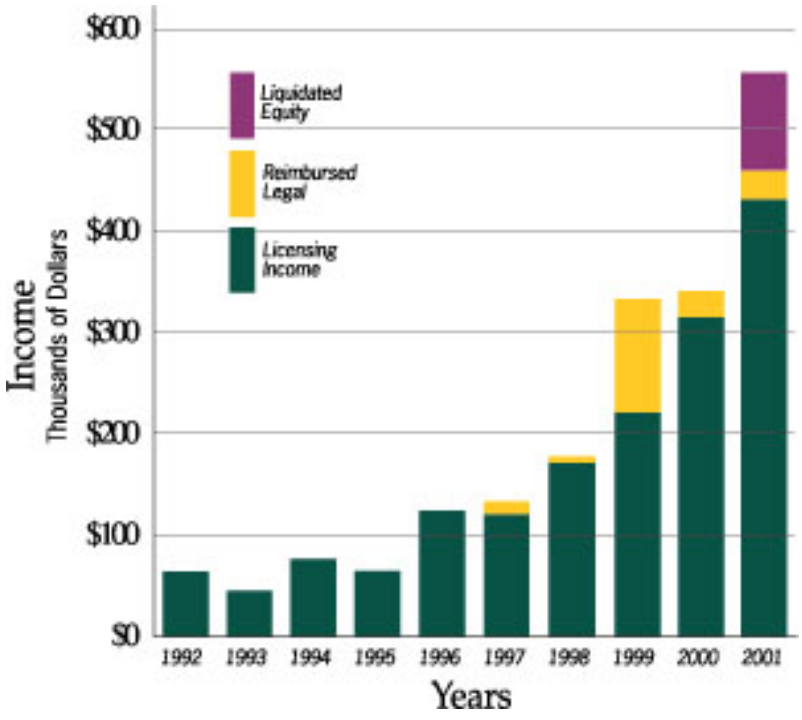
Capitalizing on Intellectual Capital

Research universities are hotbeds of new ideas, some of which will eventually make their way into the private sector in the form of products or spin-off companies. Organized technology transfer efforts at the University of Oregon are less than a decade old, but the work already is producing significant and rapidly growing results (see graph).

"Revenue from royalties and license fees hit a record high at the UO in fiscal year 2001, the sixth consecutive record-setting year for our technology licensing program," says Don Gerhart, director of the UO Office of Technology Transfer.


Don Gerhart

Total Licensing Income



How does a technology transfer office help capitalize on the university's intellectual capital? Gerhart and his staff work to guide university inventions through the transition from campus to the commercial marketplace. Each invention is unique and requires its own special handling. In the case of research that has led to the creation of new discoveries with strong but as yet unproven commercial potential, the office may bring in support from corporate partners while the technology is still being developed. This additional support allows the university to continue its ongoing basic research projects while simultaneously helping potential commercial applications transition successfully into the private sector. In other situations, such as those where the potential commercial value is immediately

UO Technology transfer activities yielding results. This graph shows the steadily increasing level of income generated through licensing of UO innovations and discoveries.

clear, the Office of Technology Transfer moves aggressively to license the invention to an existing company or to a spin-off company for further product development. When the situation calls for it, the UO tech transfer staff steers the invention through the paperwork process required to obtain patent protection.

."An important point to remember is that patents are a means to an end, and not an end in themselves," says Gerhart. "We seek patents when they are necessary to secure corporate investment in commercial development of an Oregon invention."

.Approximately 80 percent of the roughly $550,000 the UO took in this year in tech transfer revenue came from licensing of biotech and bioscience-related products. These products are primarily chemicals, monoclonal antibodies, genes, and software used for pharmaceutical or biomedical purposes. And importantly, the bulk of this technology-generated revenue comes from Oregon companies.

."In other words, the economic achievements of Oregon biotech and bioscience companies were a major factor in UO's record-setting level of licensing revenue," Gerhart says. "I see a direct benefit for the state in that our tech transfer activity is maturing and resulting in tighter linkages between university innovation and the growth of Oregon's knowledge-based economy, including our state's relatively young, but rapidly developing, biotechnology and bioscience industries."

.Of course, not all technologies transferred from the UO are in these areas. Other UO inventions span a variety of other fields, ranging from nanotechnology to agriculture to databases for cataloguing art collections. Spin-off companies developed with assistance from the Office of Technology Transfer have entered a number of different fields, including telecommunications, edu-business, and artificial intelligence.

."The benefits of tech transfer to the state are enormous," Gerhart says. "Oregon citizens are prime beneficiaries because the benefits come in one way or another to them: existing businesses get new business, spin-offs take flight, the UO research enterprise becomes better-supported, graduate students have better opportunities for education and employment, and the state receives additional tax revenue on the economic activity. It's definitely a win-win situation."

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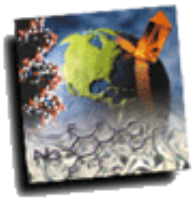

Office of Technology Transfer

Major Objectives

- To ***transfer*** new knowledge and technology for the benefit of the public
- To ***diversify*** and increase corporate support of faculty research
- To ***protect*** and manage the intellectual property assets of the University

Services Offered

- Assist in identifying research results having commercial potential
- Evaluate new discoveries to determine potential for commercialization
- Administer the preparation, filing, prosecution and maintenance of patent applications, trademarks, and copyrights
- Comply with federal reporting requirements for new inventions
- Market intellectual property rights having commercial potential
- Negotiate licensing arrangements with corporate partners
- Administer existing license agreements to ensure product development and royalty payments to the University
- Administer the transfer of materials (e.g., cell lines, clones) between the University and others to protect intellectual property rights
- Facilitate the development of startup companies based on the UO technology

INQUIRY

Fall 2001

Riverfront Research Park Is Home to Start-ups, Spin-offs

.The Riverfront Research Park (RRP) is a cooperative effort of the University of Oregon and private developers to build a university-related research park on a state-owned site adjacent to the university campus in Eugene. The 67-acre project, located along the south bank of the Willamette River, provides a master-planned setting for approximately one million square feet of development. Here knowledge-based businesses can start and grow in proximity to and in collaborative association with the sizeable research capabilities of the UO.


Diane Wiley

."We've been providing a space for this special kind of interaction since 1993 when the research park opened the doors of its first building," says RRP Director Diane Wiley. " Since then the park has proven to be a real benefit to the university, the business community, and the people of Oregon."

.Tenants in the park have been involved in many rapidly advancing, technology-driven areas, including optics, neuroscience, biotechnology, internet-based multimedia, software, web design, and artificial intelligence.

."The park is an important contributor to the diversification of our local economy," says Wiley. "These forward-looking businesses play an increasingly vital role as the character of Oregon's economy continues to evolve."

.To date, there are three buildings totaling 111,000 square feet of space. In addition to established tenant companies, fourteen tenants have started their operations in the park, more than 350 students have been employed in part-time positions, and approximately 110 UO graduates have been hired into full-time positions. In 2000, the average employee's salary and benefits exceeded $50,000.

.The businesses profiled below, all launched at the park, give a sense of the variety of research and


1600 Millrace Drive, Riverfront Research Park

technology activities occurring there.

Electrical Geodesics, Inc. (EGI) is a direct spin-off from research in the UO's Institute of Neuroscience and Department of Psychology. EGI licenses technology from the UO. It designs, produces, and sells neuro-imaging equipment and related software, and employs undergraduates, graduate students, and postdoctoral fellows, serving as a training ground in the field of cognitive neuroscience.

On-Time Systems, Inc. (OTS) is a start-up company established to transfer artificial intelligence technology developed at the UO's Computational Intelligence Research Laboratory (CIRL) and elsewhere to practical applications for optimizing routing, scheduling, and industrial tasks for both government and industry. For example, OTS designed an aircraft routing system that takes into account an aircraft's weight, its destination, and weather conditions to chart the most fuel-efficient route between North America and Europe. Based on this program, the Air Force hopes to save one to three percent in fuel costs per year, which is approximately 15 million gallons of jet fuel. Three CIRL faculty members started OTS, which is currently entering a period of rapid growth.

Marker Gene Technologies, Inc. (MGT) was founded by an adjunct faculty member in the UO's Department of Chemistry and Institute of Molecular Biology. The company explores, develops, and manufactures new ways to use marker genes in molecular biology and in the medical field. The company collaborates with the Oregon Health & Science University and Portland's Earle A. Chiles Research Institute on gene therapies and treatment protocols for people with inoperable cancers. MGT is currently collaborating with a number of biotechnology and pharmaceutical companies, and anticipates a very positive future growth.

Language Learning Solutions, Inc. (LLS) is a new company that is spinning out of the UO's Center for Applied Japanese Language Studies (CAJLS). LLS will focus on the development, sale, and support of tools that help teachers assess the acquisition of new languages by students.

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RIVERFRONT RESEARCH PARK

PARK TENANTS

- Agate Resources
- BELLS
- Center for Applied Second Language Studies
- Center on Teaching and Learning
- Computational Intelligence Research Laboratory
- Electrical Geodesics
- Human Subjects Compliance
- Interlingua
- kbobsoft
- Lane Home Medical
- Language Learning Solutions
- Marker Gene Technologies
- MitoScience
- Neuroinformatic Center
- Office of Research Services and Administration
- Office of Responsible Conduct for Research
- On-Time Systems
- Oregon Research Institute
- Pacific Institutes for Research
- SeQuential Biofuels
- Technical Assistance and Consulting Services/Western Regional Resource Center
- Technology Transfer
- Zebrafish Information Network

Located side by side with University of Oregon departments, private tenants are engaged in the fields of neuroscience; biotechnology; behavioral science research; artificial intelligence; internet-based networking and multi-media; software, web design, language tool development, reading program development, and

policy and program development for people with disabilities. They enjoy synergistic relationships with UO researchers, faculty and administration.

Agate Resources is a diversified company that integrates office administrative functions, with health-related research and software development, to insure quality services are delivered with state-of-the-art technology and information. These business and administrative services are provided to employer and physician groups helping to insure that high-quality, affordable health care is provided in Lane County.

The company develops a variety of proprietary software related to the medical field. It develops software that manages and tracks referrals among physicians; software that tracks credentialing of physician education, training, and certifications, including required reporting to state and national organizations; and software that handles the complex legal and financial administration of the healthcare industry. Additionally, the company also conducts healthcare studies and grant-funded research.

BELLS produces and distributes Dow Jones Business English **(DowBE)**, a dynamic online English learning program based on current Dow Jones content and individualized learning technology. The pedogogic framework for DowBE was created by a team of experts in teaching English as a Second Language from the University of Oregon. BELLS has combined the most advanced learning strategies with cutting edge Internet and database technology to develop its Dow Jones Business English program.

Center for Applied Second Language Studies (CASLS) is a K-16 National Foreign Language Resource Center dedicated to improving the capacity of the nation to effectively teach and learn foreign languages. CASLS accomplishes this in a variety of ways, such as creating and disseminating online proficiency-based reading and writing assessments, integrating language with other academic content areas, and providing rural teachers with world-class materials, assessments, and professional development through appropriate technology.

Center on Teaching and Learning (CTL) is a community of scholars whose mission is to conduct, translate, and disseminate research focused on solutions to practical problems in schools. CTL is an alliance of faculty members who seek to advance understanding and use of evidence-based practices to prevent and

intercept academic difficulties in school-aged children. A primary emphasis of CTL is the role of curriculum, instruction, and assessment in school-side models of academic reform. CTL's research and outreach include school based experimental research, model demonstration projects, and large-scale professional development and technical assistance.

Current projects housed in the Research Park within CTL are:

- **Center to Improve Reading Competence Using Intensive Treatments Schoolwide** (CIRCUITS) - The overarching goal is to implement, evaluate, replicate, and disseminate systemic prevention models that will accelerate and sustain the early reading achievement of students with reading disabilties or at risk of disabilties in grades K-3.
- **Oregon Reading First** (ORF), funded to support the Reading First Program for the State of Oregon, was established as part of the No Child Left Behind federal legislation, with the goal of improving student achievment in reading through the application of scientifically based reading research.
- **Western Regional Reading First Technical Assistance Center** offers a national network of experts in topics critical to high quality, scientifically based reading instruction, including curriculum selection and implementation, professional development, and assessment.
- **Dynamic Indicators of Basic Early Literacy Skills** (DIBELS) are a set of standardized, individually administered measures of early literacy development. They are designed to be short one-minute fluency measures used to regularly monitor the development of pre-reading and early reading skills.

The Computational Intelligence Research Laboratory (CIRL) is a Research Institute of the University of Oregon and is composed of the top scientists conducting research in the field of artificial intelligence. The group researches new techniques in artificial intelligence to enhance the ability to plan a vast array of complex procedures, by creating algorithms that allow a computer to compile both a flexible pattern of problems solving, yet also consider all potential solutions.

CIRL scientists are working to optimize task order through improving scheduling and resource allocation, which can substantially improve an organization's productivity and competitiveness. A variety of other optimization problems, such as aircraft routing to minimize fuel use, are also being studied. A

number of optimization techniques invented at CIRL produce better solutions than any other known technique on a variety of real-world problems. CIRL research is licensed to On-Time Systems, Inc., a Eugene company that develops optimization applications.

Electrical Geodesics (EGI) is a direct spin-off from research in the UO's Psychology Department Brain Electrophysiology Laboratory. EGI, a company which started in the Research Park, licenses technology from the UO. It designs, produces, and sells electrophysical neuroimaging equipment and related software, and employs undergraduates, graduate students, and postdoctoral fellows, serving as a training ground in the field of cognitive neuroscience. EGI's products allow for accurate measurement of brain activity, which is beneficial in treating strokes, presurgery planning, neonatal monitoring, epilepsy treatment, and other neurological monitoring. The company received FDA approval to sell its neuroimaging equipment and software for medical use and has partnered with an Italian firm that has a complementary line of products.

Human Subjects Compliance assumes the responsibility to ensure that state and federal guidelines are met for the protection of the rights and welfare of human subjects who participate in research and other activity projects conducted by faculty, staff and students at the University of Oregon. The university maintains an institutional review board competent to review research involving human subjects and to evaluate both risk and protection against risks for those subjects.

kbobsoft is a small contract software company. kbobsoft's specialties include server applications under Linux and Unix and Linux-based embedded systems.

Lane Home Medical (LHM) researches, develops and continually upgrades software related to the medical field and is a Doctor's Medical Equipment provider to Lane County physicians. LHM develops a variety of medical software programs. One product manages the complex contracting requirements between physicians and health insurance companies. Another program tracks referrals among physicians. LHM also develops and sells software that tracks physician education and training, with required reporting to state and national organizations.

Language Learning Solutions (LLS) is a private company with a license to market and sell UO technology spun off from Center for Applied Second Language Studies research. LLS develops and

sells online assessments and curriculum in foreign languages to school districts and colleges nationwide. In addition, the company's technology can accommodate English as a Second Language (ESL), and can adapt to other curricula as well. The company has a major ESL test development project with the State of Minnesota, and also delivers the National Spanish Exam online and an online survey for the Society of Thoracic Surgeons.

Marker Gene Technologies (MGT) another company which started in the Research Park, was founded by an adjunct faculty member in the UO's Department of Chemistry and Institute of Molecular Biology. The company explores, develops, and manufactures new ways to use marker genes in molecular biology and in the medical field. MGT collaborates with the Oregon Health Sciences University and the Earle A. Chiles Cancer Research Institute on gene therapies and treatment protocols for people with inoperable cancers and expects to begin Phase I Clinical Trials on these techniques in the next one-to-two years. The company conducts business with the UO Monoclonal Antibody Facility and the Oregon Veterinary Services and Animal Care Facility, helping to make the facilities nearly self-supporting. MGT also is currently collaborating with a number of biotechnology and pharmaceutical companies and anticipates a very positive future growth.

MitoSciences, a spin-off from the UO's Monoclonal Antibody Facility specializing in mitochondrial structure and function, has invented over 50 unique monoclonal antibodies against mitochondrial proteins. As an active research participant in the areas of genetic mitochondrial diseases, mitochondrial dysfunction from neurodegenerative diseases, mitochondria involvement in cancer and apoptosis, environmental toxins, oxidative stress, and side effects of therapeutic drugs, MitoSciences provides the best monoclonal antibodies in the world while providing experienced researchers that understand the nature of this research and can help maximize research efforts.

Neuroinformatics Center (NIC) of the University of Oregon will bring advanced informatics to brain research. In the near term, NIC will demonstrate the capability of creating a high-resolution finite element model of human head tissues, which will be used in the analysis of brain function by integrating information from EEG and MRI sources. Over the longer term, the NIC will develop the informatics resources required to integrate structural MRI with dense-array EEG for medical applications such as acute ischemic stroke. Funded in part by the Telemedicine and Advanced Technology Research Command, the NIC is interested in providing access to neuroinformatics technology over the internet. It brings together outstanding Oregon researchers in cognitive

neuroscience and high-performance computational science with a leading Oregon company specializing in advanced, high-density EEG recording, analysis, and medical applications.

Office of Research Services and Administration (ORSA) provides assistance to University of Oregon faculty, staff, and administration who seek, obtain, and manage extramural funds in support of their research, instructional programs, and public services projects.

On-Time Systems (OTS) is a local company established to transfer optimization technology developed at the university's Computational Intelligence Research Laboratory (CIRL) and elsewhere to practical applications for optimizing routing, scheduling, and industrial tasks for both government and industry. For example, OTS designed an aircraft routing system that takes into account an aircraft's weight and destination, as well as the weather, to chart the most
fuel-efficient route between North America and Europe. Based on this program, the US Air Force hopes to save one to three percent in fuel costs per year, or approximately 15 million gallons of jet fuel. The company is also working on scheduling software that reduces the cost of shipbuilding.

Oregon Research Institute (ORI), founded in 1960, has developed an international reputation in the behavioral sciences and is a leader in the conduct of socially relevant research. ORI's work makes significant contributions to understanding the causes, prevention, and treatment of social and medical problems including adolescent depression, childhood behavioral problems, tobacco and other substance use, and chronic physical illess. Research projects housed in the Riverfront Research Park include a study aimed at understanding the link between stress and breast cancer and a new way of helping women with breast cancer cope with their diagnosis and treatment.

Pacific Institutes for Research (PIR) serves both basic and applied purposes, with a strong record of research accomplishments in the areas of special education, social policy, and technology. PIR works closely with the Oregon Reading First Center to research, create, and implement reading programs for students.

SeQuential Biofuels promotes biodiesel, a clean burning alternative fuel and lubes that are domestically-produced from renewable materials and that perform as well or better than conventional products.

Technical Assistance and Consulting Services/Western Regional Resource Center (TACS/WRRC) provides technical assistance to state education agencies and Part C lead agencies to assist and support them in systemic improvement policies, procedures and practices which will result in quality programs and services for children with disabilities and their families. It offers consultations, technical assistance, training, product development and information services, including research.

Technology Transfer helps university inventions successfully make the transition from academia to the commercial marketplace. The office identifies promising early-stage research with strong commercial potential, brings in investors and support from corporate partners, and moves aggressively to license inventions to an existing company or to a spin-off company for further product development.

Zebrafish Information Network (ZFIN) is a web-based, worldwide resource that serves as a centralized location for the curation and integration of zebrafish genetic, genomic and developmental data. The zebrafish has emerged as a model organism important for the identification and characterization of genes and pathways involved in development, organ function, behavior and disease. ZFIN provides an integrated representation of mutants, genes, genetic markers, mapping panels, publications, and community contact data.

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Electrical Geodesics, Inc.

When time counts...

Exploring Your Mind

Richard Davidson's work on meditation is featured in the March 2005 issue of National Geographic. An excerpt of the article is available online at National Geographic.

Training Events

EGI Summer School

Mark your calendars! The dates for EGI's sixth annual Summer School have been announced:

- Basic Section: July 27-29
- Advanced Section: August 1-3

To find out more and to download the registration packet, visit our Education page.

BESA Workshops

EGI and MEGIS Software will hold two hands-on workshops focusing on BESA 5.1.

An April 2005 workshop will be held in

FDA Clearance

EGI's Geodesic Photogrammetry System (GPS) is now available as a medical device in the United States. (For a description of the GPS, see the July 2004 newsletter and the GPS webpage.)

Clinical EEG Systems

Geodesic EEG System 120 is the 32-channel clinical EEG system you want when time counts.

Geodesic EEG System 250 (Clinical) enhances recording accuracy and patient comfort for clinical dense-array (64-, 128-, or 256-channel) EEG applications.

Please send me additional information about EGI's clinical systems.

New York City; a June 2005 workshop is scheduled for Toronto, Canada.

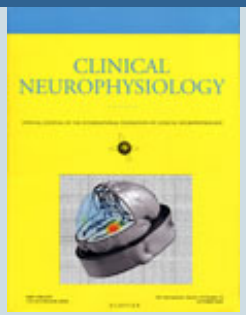
Research EEG Systems

Geodesic EEG System 140 is the 32-channel system that makes research a breeze.

Geodesic EEG System 250 (Research) is for you if you have a need for speed in your dense-array (64-, 128-, or 256-channel) EEG research work.

Please send me additional information about EGI's research systems.

Dense-Array EEG Source Imaging



Applications of anatomically constrained electrical source analysis with EGI's dense-array EEG have greatly improved neurosurgical planning for epilepsy at the University of Geneva. The increasing recognition of dense-array EEG source imaging in medical applications provides important validation for the advances in dense-array EEG being made worldwide now in research laboratories. (Michel et al., 2004)

University of Oregon
Institute of Neuroscience

We are an interdisciplinary research group of life scientists at the University of Oregon, with faculty and students drawn from the departments of Biology, Psychology, and Exercise and Movement Science. Our laboratories offer graduate and postdoctoral training in fields of Neuroscience and Development ranging from the behavioral genetics of nematodes to human cognitive processes. Faculty research interests include cellular neuroscience, developmental biology, neural systems, neural plasticity, and cognitive neuroscience.

Dr. Judith S. Eisen, Director

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- Zebrafish Web Server (ZFIN)
- The Zebrafish Science Monitor

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The Department of Psychology at the University of Oregon

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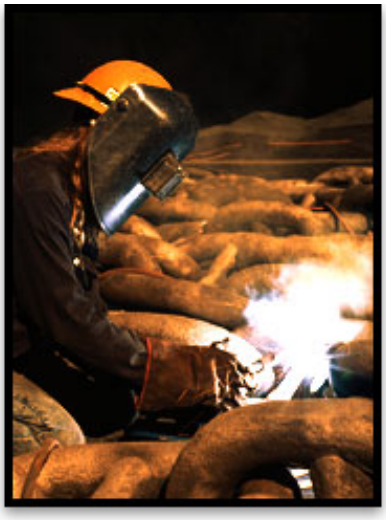

On Time Systems, Inc. (OTS) brings state of the art search-based optimization technology to industrial problems. In recent years, search-based techniques have surpassed the effectiveness of the long-dominant operations research techniques for solving a large variety of optimization problems, and OTS is at the leading edge. This lets us:

- tackle problems orders of magnitude larger,
- solve problems orders of magnitude more quickly, and
- find dramatically better solutions.

For example, OTS solutions to real-world problems faced by military and industrial clients have resulted in:

- an expected 10-15% reduction in labor costs for shipyard construction,
- an estimated 2% reduction in fuel costs for USAF cargo aircraft (projected $15M/year savings),
- 10% shorter makespan for fighter aircraft wing production
- the ability to schedule 20x more production with 20% shorter makespans for fiber-optic cable manufacturing, and
- up to a 66% reduction in lateness and 40% increase in throughput in CD manufacturing.

The Computational Intelligence Research Laboratory (CIRL) of the University of Oregon has a research focus on basic questions in artificial intelligence including search, knowledge representation, and reasoning. Emphasis is on planning, constraint satisfaction, and commonsense reasoning. Laboratory faculty members participate in some Computer and Information Sciences Department activities and shared recreational activities.

The laboratory provides financial support for students and fosters an intimate relationship among a small group of researchers working in closely-related areas and the graduate students they supervise. CIRL currently has openings for talented students. In the long term, we are committed to having no more than twice as many students as faculty members.

Research

- Comprehensive Overview: An introduction to each of the research areas in which CIRL members are working.

- Software: Some software packages developed at CIRL are available. You can view a demo that allows you to test a number of satisfiability solvers on problems of your choice, you can download the sources or binaries of some of these solvers, or if you prefer, you can download MVL, Matt Ginsberg's inference engine.

- Documents: Some CIRL-related documents are available. Links range from research papers by

CIRL members to a list of publicly available AI systems.

If you are looking for something in particular, you may want to use "site:www.cirl.uoregon.edu" as an extra search term within google.

Development

CIRL is a research laboratory, and doesn't undertake development projects, per se. However, On Time Systems, Inc. is a startup company that is developing practical, fielded, applications of CIRL's optimization technology in areas ranging from aircraft routing to scheduling of ship construction.

People

Faculty

- David W. Etherington (Director)
- Matthew L. Ginsberg

Staff

Graduate Students

- Mark Erickson
- Katie Ray

Alumni

- Andrew Baker
- Tania Bedrax-Weiss
- Iustin Benche
- Laurie Buchanan
- Dave Clements
- James Crawford
- Heidi Dixon
- Brian Drabble
- Najam-ul Haq
- Will Harvey
- Christian Hoge
- Alan Jaffray

- Ari Jónsson
- David E. Joslin
- Bart Massey
- Chip McVey
- Andrew J. Parkes
- Joe Pemberton
- Tristan Smith
- Patrycia Sullivan

Prospective Students

If you're considering applying to be a graduate student, you may find it valuable to read about what life at CIRL is like from a student's perspective and from a faculty's perspective.

If you are interested in working with CIRL faculty, please contact studentinfoNOSPAM@cirl.uoregon.edu.

Contact Information

CIRL is located in Suite 1, 1850 Millrace Drive, in the Riverfront Research Park in Eugene, Oregon, USA. An atlas of Eugene, a map, which will get you from almost anywhere in the area to the University of Oregon, and a map of the University of Oregon which shows the Riverfront Research Park, are available on line. Textual directions are also available.

Postal Address:
CIRL
1269 University of Oregon
Eugene, OR USA 97403-1269

Shipping Address:
CIRL
1850 Millrace Drive, Ste 1
Eugene, OR USA 97403

Phone: *+1 (541) 346-0470*

FAX: *+1 (541) 346-0474*

E-mail: info@cirl.uoregon.edu

CIRL faculty can also be contacted if you have questions about research agendas, etc.

Additional information about the University of Oregon's Computer and Information Science Department, including application materials for potential graduate students, can be obtained from the department's Graduate Secretary, Star Holmberg.

E-mail: star@cs.uoregon.edu

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The Staff of Marker Gene Technologies, Inc

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CASLS

The Center for Applied Second Language Studies
The Northwest National Foreign Language Resource Center

Home

Welcome to the Center for Applied Second Language Studies (CASLS) on the University of Oregon campus.

This month's article is by Bret Lovejoy. Bret is the executive director of the American Council on the Teaching of Foreign Languages (ACTFL). To find out more about ACTFL and the Year of Languages, please visit www.actfl.org.

CASLS Calendar

CASLS is currently conducting online pilot tests in the following languages. For more information, contact the language coordinator at the address given.

Chinese Reading pilot test.
Contact: chpilot@uoregon.edu

Hebrew Reading pilot test.
Contact: hbpilot@uoregon.edu

Japanese Assessment of Listening Proficiency pilot test.
Contact: jppilot@uoregon.edu

Spanish Assessment of Listening Proficiency pilot test.

Speak Up for Language Learning - Get Involved in 2005: The Year of Languages

In June of last year, the U.S. Department of Defense hosted "The National Language Conference: A Call to Action" during which it was stated that our nation is at a "Sputnik moment" in languages, with action needed akin to the U.S. response to Sputnik if we are to address our many language needs. Given the fact that the U.S. suffers from severe monolingualism, it may be necessary to discuss our language needs in terms of crisis. What is clear to me is that we face an historic opportunity to advance language learning and education in this nation.

The question then is how do we take advantage of this opportunity? If we are to change the way policy makers and the public view language education, we need to get our message in front of the public and keep it there. This is why the American Council on the Teaching of Foreign Languages (ACTFL) has developed a series of Public Service Announcements for television, radio, and print media. If we want policy makers to enact legislation that supports language education, we must get voters to demand such support from their elected officials. In order to motivate voters to speak up and demand that support, the profession must deliver the message that language education is a necessity for every student's academic development, their future work, and success in life.

Now that ACTFL has a wonderful Public Service Announcement, we need your help. In order for us to capture the momentum that is being created by the demand for people skilled in languages, every language educator (from the classroom teacher to college administrator and state and district language coordinator) must take part in activities to advocate for language education.

While ACTFL is pursuing national media exposure with good success to date, each of you can help by becoming a local "Language Ambassador," asking that the PSA be shown on local television and radio stations, and the print version be published in your local newspapers and magazines. You can find out how to become a language ambassador by going to the ACTFL web site at www.actfl.org, or the Year of Languages web site at www.yearoflanguages.org.

The Year of Languages will be a success if individual language professionals get involved and speak up for language learning in the United States. Come join ACTFL and be a part of this historic moment when we will close the language gap and place language learning at the forefront of education in the United States.

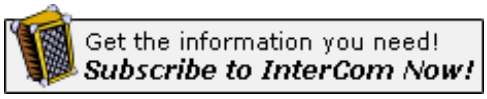
Contact: sppilot@uoregon.edu

February 18, 2005

Western Initiative for Language Learning (WILL) 2005-2006 application deadline

March 24, 2005

Carl Falsgraf will be giving a keynote speech titled Data-Driven Curriculum and Professional Development at DigitalStream Conference at California State University, Monterey Bay http://wlc.csumb.edu/digitalstream/2005/



Western Initiative for Language Leadership (WILL) Opportunity beginning June 2005

Read articles from the CASLS's archive.

5290 University of Oregon, Eugene OR 97403-5290 Tel:541-346-5699 Fax:541-346-0322 info@darkwing.uoregon.edu

INQUIRY

Fall 2001

High-tech Institute Listens to Business, Preps Students with Practical Training, Internships

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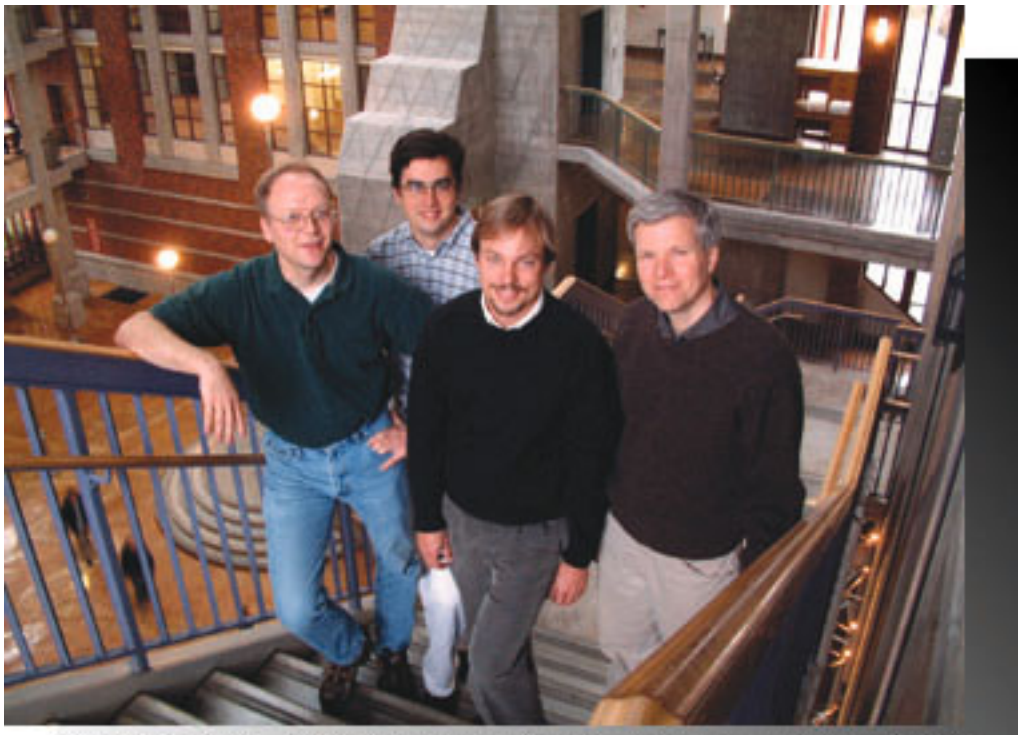
.Collaborative and carefully coordinated efforts between research universities and private industry have never been so important. The level of highly refined technical knowledge—and therefore the level of training—required for entry-level employees rises along with the complexities of the science upon which so many modern businesses are built.



Dave Johnson, Mark Lonergan, Jim Hutchinson, and David Tyler

."Huge and rapidly growing Oregon industries such as those based on microprocessors and polymers rely on advanced understanding of physics and chemistry, as well as innovative applications of the principles that guide these disciplines," says Dave Johnson, a University of Oregon professor of chemistry and the director of education and outreach for the UO Material Science Institute (MSI). "Lots of academic institutions around the country produce graduates with training in chemistry and physics, but we saw a need to also produce graduates who have background knowledge of these industries as well as hands-on experience applying their knowledge to the real-world needs of industry."

.Johnson and his MSI colleagues—a group of about eighteen professors in all—were not the only ones to see the value of a close alignment of academic training with industry needs. In 1997, the Oregon Legislature established the Engineering and Technology Industry Council (ETIC) to set criteria and measurements for guiding investments made from the Oregon Engineering Education Investment Fund, a state commitment to bolster Oregon's economic future through support for higher education. ETIC

includes representatives from many of Oregon's leading high-tech businesses (such as Intel, Electro Scientific Industries, Mentor Graphics, Hewlett-Packard, LSI Logic, and Radisys) and strongly endorses efforts in higher education to respond to industry need.

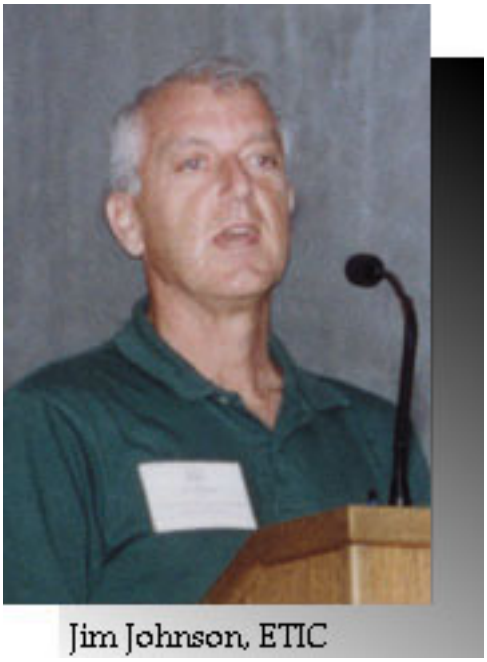
."ETIC said that Oregon businesses need and want highly trained employees and that is what we are providing," Johnson says.

.A key element of the MSI's partnership with industry is the MSI's doctorate and master's degree internship programs. While gaining practical experience and learning invaluable lessons, the students are earning a good paycheck—between $18 and $19 per hour for the six-to nine-month "microchip masters" program and from $3000 to $5000 per month in doctoral student internships.

.The program has grown rapidly since its inception in 1998.

."The program is evolving," Johnson explains. "Companies give us constructive criticism and make suggestions that we use to improve and strengthen the program. They are the experts on their needs, so we know who to listen to."

.MSI's can-do, listen-and-learn attitude is getting results. The group's funding for this biennium is more than $2 million and all funding for the past five years tops $6 million. Most graduates of the internship programs are now employed at high-paying skilled jobs, mostly at the companies where they interned, and nearly all in the Northwest—the very result that ETIC called for.


Jim Johnson, ETIC

."This is really a new and innovative approach," says Associate Chemistry Professor Jim Hutchison, who has helped develop the internship program. "It is a tremendously positive thing for higher education in this state. It is also good for industry and for the students who benefit from participating."

.Getting Good Results

.Industry has stepped up with strong support for the MSI internship program. Participating companies in the semiconductor program include LSI Logic, Hynix Semiconductor, Intel, Triquint, Novellus, Micron, and Hewlett-Packard. A number of companies in the state's growing polymer industry have also participated, including Neste Resins, Borden Chemical, Forrest Paint, Willamette Valley, and Bend Research.

.Support from these companies comes in many forms: working with MSI to create internships, paying student stipends during internships, or generous donations of equipment to UO laboratory facilities.

."While it is difficult to quantify, perhaps one of the greatest contributions from individuals in Oregon's private sector comes in the form of mentoring relationships developed with the interns," says Chemistry Professor David Tyler, who spearheads the polymer program. "This kind of guidance is invaluable. It is a generous and personal investment of time, effort and energy that pays off year after year in the developing career of the recipient of the mentoring."

.At a recent UO event, industry partners and government official gathered to celebrate the success of the industrial partnerships and internship program. Jim Johnson, ETIC chair and emeritus Intel site manager, congratulated MSI on its efforts and successes.

."MSI is the best example in the state of higher education's hardcore technology interacting closely with industry and getting a good result," Jim Johnson said. "MSI is a forerunner to what will happen in many business sectors. Oregon needs to have this kind of effort happening here to ensure our economic future. Knowledge will increasingly drive everything in business. Much of that knowledge will come from programs like this."

.While Oregon business is enthusiastic about the MSI programs, national-level recognition of the program has also recently come from the National Science Foundation (NSF). The prestigious five-year grant of $2.7 million is from the NSF's Integrative Graduate Education and Research Training (IGERT); it was awarded in support of innovative approaches to education in a number of UO departments and institutes, including MSI.

."NSF wants to spur experiments and innovation in higher education," explains Assistant Chemistry Professor Mark Lonergan, a key developer of the IGERT proposal. "Our program fits this perfectly. We designed our program to incorporate the idea of preparing students in a new way, of giving experiences outside the normal academic track, of giving them industrial internships, teaching experience, and experience at national labs."

.The IGERT funding is a source of support for graduate students and MSI-related professors.

."The funding is being used as a catalyst to organize ever more rapid evolution of these concepts of education," Lonergan says. "But even more important, what it really represents is recognition, support, and encouragement from the nation's top science funding agency. That is a coup for Oregon."

.The world has changed, so education needs to change, MSI's outreach director Dave Johnson likes to say. MSI programs give students an important sense of how science drives major industries, he

stresses.

."The biggest thing internships have shown students is that a degree isn't the end of the road," he adds. "It shows that they have demonstrated that they know how to learn and how to develop their problem-solving skills."

Back to INQUIRY home page

David C. Johnson

Professor

Solid-State Chemistry, Inorganic Chemistry, Electrochemistry & Materials Science

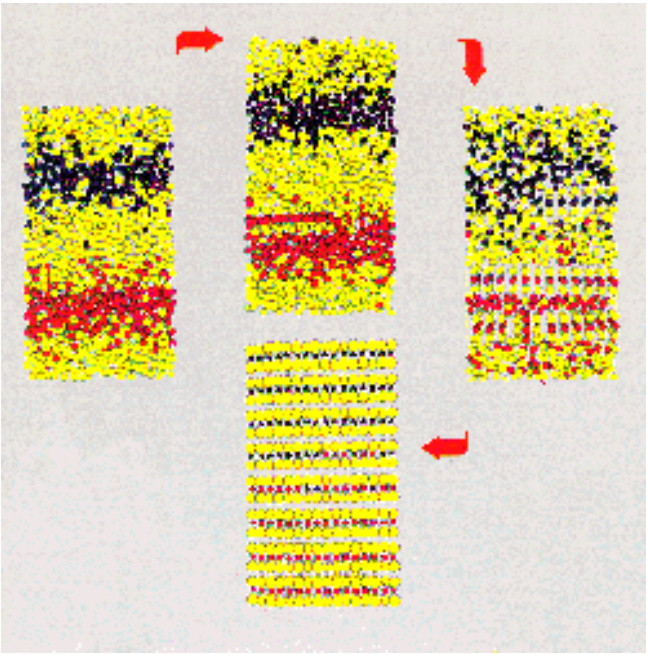
Member, Materials Science Institute

B.A., Rutgers University, 1978. Ph.D., Cornell University, 1983 (M.J.Sienko). Postdoctoral: Cornell University, 1983-84 (M.J.Sienko). Honors and Awards: Henry Rutgers Undergraduate Research Scholar, 1977-78; Office of Naval Research Young Investigator Award, 1987-1990. At Oregon since 1986.

Research Interests:

Our objective has been to develop a new synthetic strategy which overcomes the limitations inherent in the currently used techniques. The key conceptual advances which we developed are the use of a homogeneous amorphous solid as a reaction intermediate and the use of elementally modulated superlattices as a reactants.

The use of elementally modulated superlattices as reactants give us several important synthetic parameters and in situ probes which we exploit when using our synthetic approach. These reactants are prepared using thin film deposition techniques and consist of ƒngstrom scale layers of the elements to be reacted. One element can be easily substituted for another, allowing rapid



surveys over a class of related reactions and synthesis of isostructural compounds. The diffusion distance is determined by the multilayer repeat distance which can be continuously varied. This has proven to be an important advantage of our approach, allowing us to experimentally demonstrate changes in reaction mechanism as a function of interdiffusion distance. The multilayer repeat distances can be easily verified in the prepared reactants using low angle x-ray diffraction.

The second important advantage of elementally modulated reactants are the availability of in-situ probes of both energy and structure. These in-situ probes allow us to follow structural and energetic changes in reactants as a function of initial structure and subsequent annealing conditions. The short diffusion distances in the multilayer reactants result in low reaction temperatures and rapid reaction rates allowing the energetic changes occurring in the reactions to be followed using scanning calorimetry. Low angle x-ray diffraction collected as a function of temperature and time permits the interdiffusion of the reactant to be characterized quantitatively. High angle diffraction combined with transmission electron microscopy are used to determine the structure of crystalline products and the absence of crystalline compounds in amorphous intermediates. These techniques provide detailed information about the reaction pathway, enabling us to tailor the structure of the initial multilayer precursor and the annealing parameters to produce a desired product.

The information obtained from these in-situ probes has permitted us to develop reaction mechanisms for the evolution of these reactants and demonstrate how the initial structure controls the subsequent reaction pathway. We have found that it is generally possible to decrease the layering thickness to the point where binary compounds no longer nucleate at the reacting interfaces. By using ultra-thin repeat distances in the starting multilayer below this critical thickness, it is possible to completely eliminate diffusion as a rate limiting step, forming a metastable amorphous mixture. From this intermediate amorphous phase, the kinetics of nucleation determine which of many possible compounds will form. We have shown that the nucleation kinetics can be controlled by the average composition of the mixture. This approach has been used to selectively prepare both binary and ternary compounds without the formation of crystalline compounds as reaction intermediates.

Our research has shown that the synthetic strategy outlined above is successful in a variety of different materials systems. We have prepared binary and ternary selenides, carbides, silicides, and antimonides containing transition metals as well as rare earth metals using this methodology. This makes this approach very powerful for exploratory synthesis. One can avoid known compounds, which are thermodynamic traps, in a wide variety of systems using the same synthetic methodology. Present efforts are centered on ternary iron antimonide thermoelectric materials as well as ternary transition metal systems with extended metal-metal bonding. These metal-metal bonded "molecular" solids have unusual chemical flexibility and a wealth of unusual properties, which make them ideal candidates for

materials research. Synthesis is usually difficult because stable binary phases tend to form, and these are very inert towards further reaction. The kinetic control of the reaction pathway provided by elementally modulated reactants allows us to avoid the formation of these binary phases. We also exploit the chemical flexibility of these systems to fine- tune structural parameters. In this way, traditional chemical concepts such as bond ionicity and localized magnetic moments are related to more exotic phenomena such as superconductivity and lattice instabilities.

More recently, we have used the ability to tailor diffusion path lengths to prepare crystalline superlattices with designed superstructure. These crystalline superlattices contained the desired number of unit cell thicknesses of two binary or ternary compounds within the repeating unit of the superlattice. This synthesis begins with the preparation of a modulated reactant. By depositing controlled amounts of each element in a desired sequence, we control the exact amount and spatial location of all of the elements necessary to make the desired superlattice. Annealing at low temperatures results in the crystallization of the desired binary compounds, which form layers due to their spatial modulation. Higher temperature annealing eliminates defects and results in well formed crystalline superlattices.

While work in this area is relatively new, it raises exciting possibilities. What determines whether a superlattice product is a composite or a new compound? Obviously, on a micron modulation scale, the material is a composite in which the physical properties result from the component compounds. As the length scale of the compositional modulation decreases to a few ƒngstroms, a transition from composite behavior to that of a new compound should occur in which observed physical properties do not derive from the component compounds. Exploring the evolution of properties throughout this transition region presents an important opportunity to gain insight into the design of materials with desired properties. Such research is multidisciplinary in nature, presenting significant challenges in synthesizing new materials with designed structures, determining their atomic structure (particularly through the transition region between component compounds), and measuring their physical properties. Controlled crystallization of superlattice reactants provides an additional synthetic route to these materials and increases the variety of compounds which can be intergrown.

Researchers in Johnson's group characterize the materials they make in several ways. They use variable temperature X-ray diffraction (both powder and single crystal) and transmission electron microscopy to obtain structural information. They measure physical properties such as magnetic susceptibility, electrical conductivity, electron spin resonance, thermal conductivity, Seebeck coefficients, superconducting critical temperatures - in short, anything that gives them information about the electrons in the system, both as magnetic moments and as charge carriers. Because many interactions are temperature-dependent and rather weak, they measure many of these properties as a function of temperature, typically from below 4.2K to room temperature or above. The results of the measurements are used to guide further synthetic efforts. Researchers become experts in both synthesis and characterization of the new compounds they prepare.

Research in the Johnson Lab is Supported by: The National Science Foundation, The Office of Naval Research, and the National Renewable Energy Laboratory.

Selected Publications:

109. J M. Jensen, A. B. Oelkers, R. Toivola, David C. Johnson, J.W. Elam and S. M. George, "X-ray

Reflectivity Characterization of ZnO/Al_2O_3 Multilayers prepared by Atomic Layer Deposition" Chemistry of Materials, 14 (2002) 2276-2282.

110. Polly A. Berseth, Thomas A. Hughes, Robert Schneidmiller, Arwyn Smalley and David C. Johnson, "Low Temperature Synthesis Using Modulated Elemental Reactants: A New Metastable Ternary Compound NixMoSe2" Solid State Science 4 (2002) 717-722.

111. Joshua R. Williams, Mark Johnson and David C. Johnson, 'Suppression of Binary Nucleation in Amorphous La-Fe-Sb Mixtures" Journal of the American Chemical Society. 123(12) (2003) 3589-3592.

112. Joshua R. Williams, Mark Johnson and David C. Johnson, "Synthesis of Crystalline Superlattices Using the Modulated Elemental Reactant Method" Journal of the American Chemical Society, 12(34) (2003) 10335-10341.

113. Jacob M. Jensen, Sochetra Ly, Xavier Kyablue, and David C. Johnson, "Selective Preparation of Nickel Silicides and Germanides Using Multilayer Reactants," Mat. Res. Soc. Symp. Proc. 2002, 755 (Solid State Chemisry of Inorganic Materials IV), 393-397.

114. Jacob M. Jensen, Sochetra Ly, Xavier Kyablue and David C. Johnson, "Length scale dependent variation of the first nucleated phase in nickel-silicon multilayers", Journal of Applied Physics, 94(2), (2003) 1252-1257.

115. Fred. R. Harris, Stacey Standridge, Carolyn Feik and David C. Johnson, "Design and Synthesis of [(Bi2Te3)x(TiTe2)y] Superlattices", Angewandte Chemie, International Edition 42(43), (2003) 5296-5299.

116. Jacob M. Jensen, Sochetra Ly and David C. Johnson, "Low Temperature Preparation of High Temperaure Nickel Germanides Using Multilayer Reactants." Chemistry of Materials, 15(22) (2003) 4200-4204.

117. Arwyn L. E. Smalley, Seok Kim and David C. Johnson, "Effects of Composition and Annealing on the Electrical Properties of CoSb3" Chemistry of Materials, 15(20) (2003) 3847-3851.

118. Arwyn L. E. Smalley, Michael L. Jespersen, David C. Johnson, "The Synthesis and Structural Evolution of RuSb3, a New Metastable Skutterudite Compound" Inorganic Chemistry, 43(8) (2004) 2486-2490.

Additional Publications

To Contact Dr. Johnson:
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davej@oregon.uoregon.edu

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lynde@oregon.uoregon.edu

Faculty Bios

This page is best viewed in Internet Explorer V.5!

FACULTY PROFILES

PHYSICS MEMBERS ~ CHEMISTRY MEMBERS ~ ASSOCIATES

PHYSICS MEMBERS [return above]

Dietrich Belitz: Professor of Physics and Member MSI, Condensed matter physics; Dr. rer. nat. Munich 1982; Research Associate, TU Munich 1982-1985; Research Associate, University of Maryland, 1985-1987.

Research Interests: Quantum many-body theory

J. David Cohen: Professor of Physics, Condensed matter physics; Ph.D. Princeton, 1976; Member of the Technical Staff, Bell Laboratories 1978-1981.

Research Interests: Defect properties in amorphous and/or disordered thin film semiconductors, with emphasis on thin-film photovoltaic materials

Miriam Deutsch: Assistant Professor of Physics, Experimental optical physics; Ph.D. Hebrew University,

Research Interests: Photonics.

Stephen Gregory: Associate Professor of Physics, Condensed Matter Physics. Ph.D. Waterloo (Canada) 1975; Assistant Professor, Cornell University 1978-1985; Member of Technical Staff, Bellcore 1985-1992.
Research Interests: Tunneling and near-field optical microscopy, surface-plasmonic devices,molecular electronics.

Roger Haydock: Professor of Physics and Member MSI, Condensed matter physics; Sc.D., Cambridge (UK) 1989; Ph.D. Cambridge (UK) 1972; Cambridge University Demonstrator in Theoretical Physics1978-1982.
Research Interests: Electronic structure and processes at surfaces, defects, and in amorphous and disordered materials; computational physics.

Stephen D. Kevan: Professor of Physics and Member MSI, Condensed matter physics; Ph.D. Berkeley (Chemistry) 1980; Member of Technical Staff, AT&T Bell Laboratories 1980-85.
Research Interests: Surface and thin film physics; electronic structure and collective excitations at surfaces; nanoscale spatial and temporal fluctuations in magnetic and otherp complex materials.

Heiner Linke: Assistant Professor of Physics, Experimental condensed matter physics and Biophysics; MSc TU Munich 1992 Ph.D. Lund 1997. Research Associate Lund University 1997 - 1998 Australian Research Council Fellow, University of New South Wales, 1998 - 2001
Research Interests: Electronic properties of low-dimensional semiconductor nanodevices. Physical principles of biological molecular motors. Brownian motors and quantum ratchets.

Richard P. Taylor: Associate Professor of Physics and Member MSI, Condensed matter physics. Ph.D. Physics, University of Nottingham, UK, 1988; B.Sc. Physics, University of Nottingham, 1985; C.A.D., Manchester School of Art, UK, 1995; M. Art Theory, University of New South Wales, Australia, 2000
Research Interests: Chaos in the electrical and optical properties of semiconductor Nanostructures. Nanotechnology is used to construct state-of-the-art semiconductor devices that induce chaos in the flow of electrons over nano-scale distances. The resulting fractal behavior in the

device conductance can be controlled and adjusted with precision, allowing a systematic study of the fundamental properties of fractals. By cooling the devices to temperatures approaching "absolute zero" (293oC below room temperature), classical chaos evolves into quantum chaos and the effect on the fractal conductance is studied. Investigations are being extended to chaos and fractals in optical devices. In both systems, the research features an inter-play between fundamental and applied physics, with the potential for the development of novel commercial devices.

CHEMISTRY MEMBERS [return above]

Marina G. Guenza: Assistant Professor of Chemistry.
Research Interests: Development of novel, molecular-scale, statistical-mechanical theories of the structure and dynamics of complex materials.

Michael M. Haley: Associate Professor of Chemistry and Member MSI, Organic chemistry; Ph.D. Rice University 1991, Postdoctoral: University of California, Berkeley 1991-1993;
Research Interests: Synthesis of non-natural carbon networks and substructures; optical and nonlinear optical materials.

James E. Hutchison: **Director, Materials Science Institute**, Associate Professor of Chemistry and Member MSI, Ph.D. Stanford University, 1991, NSF Postdoctoral Fellow 1992-1994 University of North Carolina, Chapel Hill. At Oregon since 1994.

Research Interests: Nanoelectronics, chemically-modified surfaces, green materials chemistry.

David C. Johnson: Professor of Chemistry, Inorganic chemistry; Ph.D. Cornell University 1983; Research Scientist at E.I. DuPont de Nemours 1984-1986.
Research Interests: Novel approaches to solid state synthesis of new materials.

Mark C. Lonergan: Assistant Professor of Chemistry, Physical Chemistry. B.S. in Chemistry and Mathematics, University of Oregon 1990; PhD. Chemistry Northwestern University 1994; Postdoctoral California Institute of Technology1994-1996. At Oregon since 1996.
Research Interests: Study of polymer blends, composites and copolymers in which at least one component is optically or electrically active, such as a conducting polymer or inorganic superconductor.

Catherine J. Page: Associate Professor of Chemistry, Solid state chemistry; Ph.D. Cornell University 1984; Research Scientist at E.I. DuPont deNemours 1984- 86.
Research Interests: Novel synthetic routes to functional materials, including self-assembly of multilayer thin films and sol-gel synthesis of complex oxides.

Geraldine L. Richmond: Professor of Chemistry, Richard M. and Patricia H. Noyes Professor, Physical chemistry; Ph.D. Berkeley 1980; Assistant Professor of Chemistry, Bryn Mawr College 1980-85.
Research Interests: Optical studies of interfacial structure and dynamics.

David Tyler: Professor of Inorganic Chemistry; Ph.D. California Institute of Technology, 1979
Research Interests: Inorganic materials, polymer chemistry, photochemistry.

ASSOCIATES [return above]

Bruce Branchaud , Professor Organic and Bioorganic Chemistry
Research Interests: Organic synthesis, bioorganic chemistry, single-molecule molecular motors, molecularly imprinted polymers, new types of antioxidants

Russell J. Donnelly, Professor Emeritus of Physics.
Research Interests: Physics of fluids, low temperature physics.

Kenneth M. Doxsee, Associate Professor of Chemistry.
Research Interests: Inorganic chemistry - designed synthesis of metastable phases, phase- and shape-selective crystallization of solid-state materials. Development of environmentally benign methods for the synthesis of solid-state materials

Andrew H. Marcus: Assistant Professor of Chemistry, Physical Chemistry; B.A., University of California, San Diego, 1987. PhD. Stanford University 1993 (M. D. Fayer). Postdoctoral: The James Franck Institute at the University of Chicago, 1993-96. (S. A. Rice). At Oregon since 1996.
Research Interests: Polymer and colloid materials and their relationship to bulk thermodynamic and mechanical properties.

George W. Rayfield, Professor of Physics.
Research Interests: Application of biological materials to electronic devices.

Michael G. Raymer, Professor of Physics.
Research Interests: Quantum Information Processing; Quantum Optics; Quantum Control;Semiconductor Optical Physics; Nonlinear Optics.

John Toner, Professor of Physics, Condensed matter theory. Ph.D. Harvard University 1981.

Research Interests: Condensed matter theory ranging from studies of transport in disordered superconductors to models for the motion of flocks of birds.

Hailin Wang, Associate Professor of Physics

Research Interests: Optical properties of semiconductor nanostructures.

Engineering and Technology Industry Council

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2005-2007 Recommended Allocation
The Governor's Recommended Budget invests $21.7 million in ETIC for the 2005-2007 biennium. Details, including summary, allocation and proposals are posted at 2005-2007 Biennium.

In the News...
2004 RESEARCH OREGON - a special report by Oregon Business Magazine on college and university research programs

Raising the Grade on Educating Engineers
Portland Business Journal, 05.17.04

Recent Presentations

- ETIC proposal for 2005-2007 -- Policy/Strategy/Budget presentation; 9/24 ETIC meeting
- ETIC Presentation to OSBHE on 7/16/04 and subsequent OSBHE Press Release.
- Pre-Engineering Pipeline; community college presentation by PCC, CCC and ODE; 4/23 ETIC meeting
- ETIC Strategic Mission and Vision; strategic planning results presented at 3/19 ETIC meeting (suggestions incorporated)
- ETIC's Highlights; 12/1/03 Leadership Summit presentation by Wally Rhines
- Proven ETIC Model; 12/1/03 post-secondary education session of Leadership Summit

ETIC

Meeting Information

Next Meeting: May 9th

2005 ETIC Meeting Schedule
Meeting Minutes
New 2004 ETIC Members

Subcommittees:
Govt/Communication Task Force
Communication Strategy Outline
ETIC 2004 VIP Tours (summary)

Resources
OUS 2005 Legislative Notebook
OUS 2004 Factbook
OCKED 2003-2005 Plan
OregonEngineer.org
OSBHE Meeting Schedule
more..

ETIC Documents
Bylaws (revised 4/23/04)
Private Support Reporting Policy
03-05 Executive Summary (2/19/03)

Website contact Michele Vitali at Oregon University System. Last updated February 16, 2005

Integrative Graduate Education and Research Training:

Doctoral Training at the Interface of Chemistry and Physics: New Materials for Electronics Through Control of Nanoscale Structure

The Materials Science Institute of the University of Oregon invites students with Bachelors degrees in Physics, Chemistry, or Electrical Engineering to apply for a new innovative interdisciplinary graduate program in the fundamental sciences of materials, leading in four years to a doctoral degree in either Physics or Chemistry.

25 Fellowships from the National Science Foundation IGERT (Integrative Graduate Education and Research Traineeship) Program, and the Department of Education GAANN (Graduate . Assistance in Areas of National Need) Program, are available to support graduate students while earning a PhD.

Overview

The main features of this new program are accelerated integration of students into the Institute's interdisciplinary research projects, and the preparation of students to contribute creatively in corporate and governmental as well as academic postdoctoral employment. This is accomplished with intensive summer courses starting in the June immediately following award of the Bachelors degree, quarterly rotations through research groups starting in October of the first year, and a sequence of core materials courses during the first academic year. In addition there are units in searching and interpreting scientific literature, in verbal and written scientific communication, in materials characterization techniques such as electron microscopy, atomic force microscopy and many others, and in scientific computation.

Timeline

The program begins with one of two 10 week summer courses: the first, on semiconductors, is for those interested on the electronic and optical properties of materials; and the second, on polymers and coatings, is for those interested in soft materials, biological materials, or complex fluids. Students pursuing Physics degrees then have three weeks of preparation for the Physics Qualifying Exam which tests undergraduate and graduate physics. The results of this exam are used to recommend a curriculum tailored to each student's needs.

During the Fall, Winter, and Spring Quarters of the first year, most students take core courses in the physics, chemistry, and engineering approaches to materials. In addition to the core courses, students either fill out their background in other core subjects or begin taking advanced courses in their areas of interest. Students learn about research in the Institute by joining a different group each Quarter which ends with a talk on what has been accomplished and an exercise in the use of scientific literature.

Studentships and Internships

At the end of the first year, students continuing in the program are considered for three-year Institute Studentships to support doctoral research in the student's chosen group. At this time advisory committees are formed for each student, and as preparation for the transition to postdoctoral employment, students take a three to nine-month internship in a company, government laboratory, teaching or research at another academic institution.

In the second and succeeding academic years, students concentrate on their research projects together with the listening, speaking, and writing skills they will need to present and defend their results. Progress is monitored by each advisory committee, and this phase includes a seminar series in which students are frequent speakers, attendance at conferences to report work and to hear about related work, and finally writing and defending the Ph.D. thesis.

IGERT PROGRAM Details

For more information contact:

Catherine Hayden
Materials Science Institute
1252 University of Oregon
Eugene OR 9703

phone: 541.346.5898
fax: 541.346.3422
chayden@darkwing.uoregon.edu

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PhD Internship Programs

Chemistry PhD

Physics PhD

Master's Internship Programs

MS - Semiconductor Device Processing

MS - Polymers and Coatings

MS- Organometallics/Advanced Organic Synthesis

Internships Prepare Students for a World Beyond the Classroom

Feedback from students and industrial affiliates suggests that there is a need for polishing/finishing programs that more specifically prepare students to excel in industrial environments. The classroom and laboratory training forms the basis for the internship training. During the final phase of the program, students are placed in internships with our industrial affiliates where they gain practical experience in all aspects of microelectronic device fabrication and polymers and coatings applications. The aim of these nine month long internships is to provide students an introduction to the industrial research setting. This type of practical experience is indispensible as a means of preparing students for the challenges of the industrial workplace.

The Institute has partnered with a wide variety of affiliates to meet the career goals of each student: research or manufacturing at materials-based companies, teaching at four-year colleges, research at national laboratories, or even research at foreign universities.

Please follow these links for more information on the structure of the Internship Programs in **Semicondutor Device**

Processing, Polymers and Coatings and **Organic Synthesis**.

Congratulations to all the internship program participants awarded internships with Pacific Northwest companies.

Internship Program Placements

Polymers and Coatings	Organic Synthesis	Semiconductor Device Processing
Bend Research Inc.	Molecular Probes	Hewlett Packard
Borden Chemical	Helix	Hynix
C.W. Group	Pacific Northwest National Laboratory	Intel
Dynea		LSI Logic
Forrest Paint		Micron Boise
Willamette Valley Co.		Network Elements
		Novellus
		Planar
		TriQuint Semiconductor

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James E. Hutchison

Professor
Organic, Organometallic, & Materials Chemistry

Director, Materials Science Institute
Hutchison Lab

B.S., University of Oregon, 1986. Ph.D., Stanford University, 1991 (James P. Collman). Postdoctoral: University of North Carolina at Chapel Hill, 1992-94 (Royce W. Murray). Honors and Awards: Phi Beta Kappa; Franklin Veatch Fellowship, Stanford 1987-89; Centennial Teaching Assistant Award, Stanford, 1990; NSF Postdoctoral Fellow, 1992-94; Camille and Henry Dreyfus New Faculty Award, 1994; NSF CAREER Award, 1997; Alfred P. Sloan Research Fellow, 1999; Camille Dreyfus Teacher-Scholar, 1999. At Oregon since 1994.

Principal Research Interests

Research in the Hutchison lab focuses on molecular-level design and synthesis of functional materials, including ligands, surfaces and low-dimensional nanostructures. In each area we design structures to exhibit a desired function and test the efficacy of the new materials for specific applications. To prepare functional nanostructures and extended materials we prepare functionalized organic and inorganic chemical building blocks that are designed to assemble into organized structures such as two-dimensional films (monolayers) or one-dimensional arrays (lines). We test ideas about the preparation of complex molecular assemblies in solution and on surfaces and try to understand how the structure of the building blocks influences the assembly's structure, reactivity, stability, and electronic properties. Whenever it is feasible our designs for new processes and materials are based upon the principles of green (environmentally-friendly) chemistry. Our synthetic efforts are directed toward the preparation of well-defined materials for elucidating structure/property relationships. Physical characterization of these samples presents a challenge that is met through application of a wide range of instrumental methods.

Functionalized Gold Nanoparticles and Nanoparticle Arrays

Nanoscale electronic devices based upon single-electron charging are promising candidates for smaller and faster electronic circuits. New methods of nanofabrication are needed to attain these small dimensions. One method, that we have termed ³biomolecular nanolithography,² involves assembly of metal nanoparticles onto biopolymeric (polypeptide and DNA) scaffolds to form lines and more complex patterns.. We arrange specifically-functionalized gold nanoparticles into nanoassemblies that exhibit single-electron charging effects at room temperature. We continue to explore the potential of biomolecular nanolithography as an approach to generating molecularly-integrated nanocircuits and as a greener approach for the future of the microelectronics industry. We are also exploring the reaction chemistry of the gold particles so that we can tune the particle's solubility, reactivity, and interparticle spacing utilizing unique mixtures of inert capping and reactive bridging ligands. The electrical properties of the functionalized nanoparticles and their nanoscale arrays are being investigated to obtain a fundamental understanding of electron transport in these nanoscale systems.

Conformationally-Preorganized Malonamides as Ligands and Materials for F-Block Ion Chemistry

Designing effective metal ion receptors is an important challenge in inorganic and supramolecular chemistry. In addition to improving our understanding of ion-receptor interactions, such studies lead to new receptors that are useful in applications that involve sensing, separating, sequestering, and delivering metal ions. We recently discovered that by ³preorganizing² a malonamide ligand so that the donor groups are ideally positioned for binding, a dramatic (10 million-fold) enhancement in binding for f-block ions is achieved. This discovery provides an opportunity to explore the coordination chemistry of this new ligand class and to use the members of this class as building blocks for the preparation of functional materials. On-going efforts involve development of methods for preparing new ligands and materials; characterization of the ion affinity and selectivity of new ligands; and discovery of materials for applications, including membrane-based separations, ion-sensitive surfaces, polymeric ion sequestering agents, etc.

Interchain Hydrogen Bonding in Organic Monolayers on Metal and Oxide Surfaces

Organic thin films on surfaces are important model systems for studying interfacial phenomena and have a number of important applications in fields ranging from materials science to biomedicine. Self-assembled monolayers (SAMs) are formed by adsorption of molecules onto surfaces to yield a single molecular layer. We pioneered the study of amide-containing monolayers wherein lateral hydrogen bonding between the molecules occurs in the plane of the SAM. By designing molecules with specific hydrogen bonding sequences, we can control the structure, stability and electronic properties of the SAM. In the case of mixed monolayers, we have used hydrogen bonding to drive nanoscale patterning of the surface through phase separation. Currently we are designing new adsorbate molecules through which we can systematically control nanoscale patterning and monolayer stability on metal and oxide surfaces.

Selected Publications:

35. Reed, S. M.; Hutchison, J. E. ³Green Chemistry in the Organic Teaching Laboratory: An Environmentally Benign Synthesis of Adipic Acid,² J. Chem. Educ. 1999, 77, 1627-1629.

45. Weare, W. W.; Reed, S. M.; Warner, M. G.; Hutchison, J. E. ³Improved Synthesis of Small (dCORE =1.5 nm) Phosphine-stabilized Nanoparticles² J. Am. Chem. Soc., 2000, 122, 12890-12891.

46. Smith, R. K.; Reed, S. M.; Lewis, P. A.; Monnell, J. D.; Clegg, R. S.; Kelly, K. F.; Bumm, L. A.; Hutchison, J. E.; and Weiss, P. S. ³Phase Separation within a Binary Self-Assembled Monolayer on Au {111} Driven by an Amide-Containing Alkanethiol,² J. Phys. Chem. B., 2001, 105, 1119-1122. Cover.

49. Brown, L. O.; Hutchison, J. E. ³Formation and Electron Diffraction Studies of Ordered 2-D and 3-D Superlattices of Amine-stabilized Gold Nanoparticles,² J. Phys. Chem. B 2001, 105, 8911-8916.

53. Lumetta, G.J.; Rapko, B.M.; Garza, P.A.; Hay, B.P.; Gilbertson, R.D.; Hutchison, J.E. ³Deliberate Design of Ligand Architecture Yields Dramatic Enhancement of Metal Ion Affinity,² J. Am. Chem. Soc. 2002, 124, 5644-5645. Highlighted in Science Magazine as an Editors' Choice article "Designer Bindings" (2002, 296, 985) and in Chemical and Engineering News as a Science Concentrate "Designed Ligands Boost Metal Binding" (2002, 80(20), 37). Also highlighted on the Department of Energy Office of Science homepage.

59. Warner, M. G.; Hutchison, J. E. "Formation of linear and branched nanoassemblies of gold nanoparticles by electrostatic assembly in solution on DNA scaffolds," Nat. Mater. 2003, 2, 272-276. Highlighted in News and Views in Nature Materials 2003, 2, 214-215.

Additional Publications

To Contact Dr. Hutchison:
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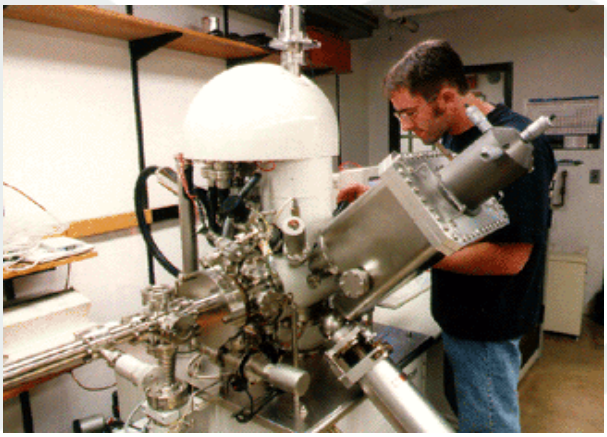
Materials Science Institute Facilities and Equipment



Materials Synthesis and Characterization Instrumentation Housed in Individual Laboratories

- **Amorphous Semiconductor Growth System** Plasa-enhanced chemical vapor deposition system (CVD) for producing amorphous silicon alloy semiconducting films. Contact David Cohen (541)346-4775.
- **UHV Modulated Thin Film Deposition System** An ultra-high vacuum electron beam deposition system designed to fabricate reactive, modulated, multilayer, thin film composites. Contact David Johnson, (541) 346-4612.
- **III-V Semiconductor Molecular Beam Epitaxy System** An ultra-high vacuum thin-film deposition system equipped with thermal effusion cells for epitaxial growth of III-V semiconductor heterostructures. Contact Peter Sercel (541) 346-4798.
- **Spectrally Resolved Cathodoluminescence Imaging Facility** An optical fiber-based scanning cathodoluminescence imaging equipped with a cryogenic sample stage, grating monochromator and detectors spanning the visible and near infrared regions of the electromagnetic spectrum. Contact Peter C. Sercel (541) 346-4798.

Materials Characterization Laboratories

The Materials Characterization Laboratories house instrumentation for the analysis of a wide range of samples including: polymers, solid-state materials, surfaces, and organic and inorganic thin films. Instrumentation is cooperatively managed and maintained by members of the department of chemistry and members of the Materials Science Institute.

Powder X-Ray Diffractometers

Philips X'Pert PW3040 - optimized for the study of ultrathin films
Scintag XDS2000 - modified for variable temperature experiments

Solid-state NMR

Varian INOVA 300 NMR Spectrometer configured with cross-polarization - magic angle spinning (CP-MAS) capabilities for the analysis of solid samples.

SQUID Magnetometer

Quantum Design MPMS-XL5S system. The

- **Electron Spin Resonance System** Instrumentation consists of a Varian E4 X-band spectrometer and a Bruker ER-300D X-band spectrometer (located in the CRIS facility). Both include computer controlled data acquisition, and operation over a 4-400 K variable temperature range is available. Contact: David Cohen (541) 346-4775 or Catherine Page (541) 346-4693.
- **Capacitance Spectroscopy Facility** Provides a full range of junction capacitance methods (0.1 Hz-1MHz, 20K- 500K), including DLTS, photocapacitance, etc. (for determining gap state distribution in semiconductors). Contact David Cohen (541) 346-4775
- **Variable Temperature Conductivity System** Operates in the temperature range 10-380K. Contact David Johnson (541) 346-4612.
- **Surface and Interface Instrumentation** Facilities include a variety of surface preparation and analysis capabilities, a novel helium atom scattering apparatus, and a crystal cutting and polishing apparatus. Access to synchrotron radiation-based high-resolution photoemission equipment is also available for precise characterization of surface and interface electronic structure. Contact Stephen Kevan (541) 346-4742.
- **Electrochemical Instrumentation** Electrochemical instrumentation for ultrasensitive materials characterization in solution. Contact Geraldine Richmond (541) 346-4635.
- **Materials preparation equipment:** Bell jar evaporator with deposition monitor for evaporation of metals, spin coater.

Chemical Research Instrumentation Services (CRIS) This facility houses state of the art instrumentation for molecular characterization including:

- NMR and ESR: GE Omega 500 MHz FT NMR and a new Varian Inova 300 routine access multinuclear FT NMR system. Bruker ESP 300 ESR spectrometer with accessories for low temperature work.
- IR and UV/vis: Nicolet Magna-500 FTIR equipped with external reflection and attenuated total reflection (ATR) accessories and a Nicolet 200 SXV FTIR with extended

MPMS is a flexible tool for examining the magnetic properties of materials as a function of temperature and applied magnetic field. Purchased with support from the National Science Foundation and the UO.

X-ray Photoelectron Spectrometer (XPS)

Kratos Analytical Ultra-High Vacuum Axis Hsi X-Ray Photoelectron Spectrometer equipped with monochromatic x-ray source, angle-resolution and depth profiling capabilities.

Woollam M44 Spectroscopic Ellipsometer

Contact Angle Goniometer

Gel Permeation Chromatography System

A Waters system with both refractive index and UV/vis detection for molecular weight characterization.

Thermal Analysis

An integrated system including a modulated Differential Scanning Calorimeter, Thermogravimetric Analyzer.

Device Fabrication and Electrical Characterization Lab

A semiconductor device physics and chemistry laboratory houses photolithography, high vacuum deposition and other semiconductor device processing equipment as well as instrumentation for the electrical characterization of materials and devices.

Shared Laser Facility

A wide variety of state-of-the-art laser systems is available in the University of Oregon Shared Laser Facility, a multidisciplinary laboratory shared by materials scientists, physicists, chemists and optical scientists. At present, there are seven apparatuses in the laboratory, spanning wavelengths from the vacuum ultraviolet to the infrared, intensity from

wavelength capabilities. HP 8453 diode array spectrophometer.

- Mass spectroscopy: A Kratos MS-50TC RF with EI, CI, field desorption and FAB/LSIMS modes and a MALDI-TOF-MS are available for our use at the NIEHS-funded facility at Oregon State University in Corvallis. Intercampus shuttle is used to deliver samples on a daily basis.
- X-ray diffraction: Enraf-Nonius CAD-4 and CAD-4 Turbo, both PC controlled. Includes parallel beam geometry and four-circle capability (Scintag X-1 theta-theta diffractometer with PTS goiniometer)
- Molecular modeling: Silicon Graphics Workstation and SPARTAN molecular modeling software

(Chemistry Research and Instrumentation Services (CRIS) oversees the majority of the instruments used for molecular characterization within the chemistry department). Two full-time Ph.D. instrumentation specialists oversee the operation of the instruments within CRIS. They are also available for consultation on advanced experimental protocols and have expertise in the areas of Nuclear Magnetic Resonance (NMR) Spectroscopy and X-ray diffraction.

Computing Facilities

Scalably Parallel Computing Facility

The Materials Science Institute collaborates with the Computational Science Institute on the scalably parallel modeling of materials on a system of Silicon Graphics Power Challenges with a peak capacity exceeding 7 GFLOPS. Contact Roger Haydock at (541) 346-5221.

The Department of Chemistry, associated Research Institutes, and the University of Oregon as a whole provide an excellent computational environment for theoretical and computational work in chemistry. Many laboratories have one or more dedicated Unix workstations, as well as workstation-capable Windows and Macintosh platforms. The University computing center provides access to a modern VAX machine, as well as sophisticated Unix systems including a Sun multiprocessor system and a Digital alpha-cluster. The Computer Science Department maintains sophisticated

microwatts to megawatts, temporal resolution down to tens of femto-seconds, and spectral resolution down to hundreds of kilohertz. Laser systems available for general use include: a high resolution IR diode laser spectrometer; a cavity-dumped Kerr-lens-modelocked titanium: sapphire laser, pump/probe interferometer with sub-hundred femtosecond resolution and a time-correlated single photon counter with 50 picosecond resolution; a cw-modelocked pulse-compressed Nd:YAG laser and sub-picosecond dye laser; several pulsed Nd:YAG lasers; two ion lasers; and a cw ring dye laser. Two high-speed vacuum pumps service four supersonic molecular beam apparatuses. The Shared Laser Facility is supervised by Dr. David S. Alavi (dalavi@oregon.uoregon.edu) who is available to advise and assist any groups using laser- and/or optics-based experimental techniques.

Microscopy Facilities A wide range of optical, electron and scanning probe microscopes are available to researchers in the MSI.

H.M. Howard Bio-optics Facilities

Zeiss Research Microscopes (2) - fitted for epi-fluorescence, Nomarski differential interference contrast, phase contrast, and dark field imaging

Geology Electron Microprobe Facility

CAMECA SX50 Electron Microprobe
JEOL JSM-6300V Scanning Electron Microscope - Fitted with an energy dispersive x-ray detector (EDX)

University Electron Microscopy Facility

AMR1000A Scanning Electron Microscope
Philips EM300 Transmission Electron Microscope
Philips CM-12 TEM/STEM - equipped for cryomicroscopy

Materials Characterization Laboratory

parallel processing environments including 22 processor and 256 processor machines for collaborative or independent work of scientists. Within the Department of Chemistry and associated Institutes, there are extensive hardware and software facilities for imaging and modeling of biological macromolecules, as well as standard molecular tools such as Gaussian 94 and Spartan. The University has an excellent, award-winning Internet system, including special Supercomputer Center links. The University Computing Center and the Technical Science shops provide excellent consulting on software and systems.

Other Support Facilities

Centrally located support facilities include a scientific glass-blowing shop, both student and professional machine shops, and an electronics shop. The staff members of these shops have been trained to accomplish nearly any task required for the construction and maintenance of scientific instrumentation. A University Science Stores stocks common scientific materials and equipment, and a chemical waste support facility is adjacent to the science complex .

Digital Instruments Nanoscope IIIa/MultiMode Scanning Probe Microscope - For scanning tunneling, atomic force and related microscopies

.**The Science Library**

The Science Library offers students over 300,000 volumes and 3,500 journals dedicated to science. Far more, however, is available for researchers in electronic format in the form of journals, indexes, and abstracts available online. To assist students in their searches, the Science Library has the Information Technology Center (ITC). The center provides computers and graphic software (for graphic manipulation and web-page design), xterminals (for internet access), scanners (both slide and flatbed), and digital cameras. Student assistants are available several hours each day to help those in need. A wealth of scientific information is, quite literally, at your fingertips in the Science Library.

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David R. Tyler

Professor
Inorganic, Organometallic, & Polymer Chemistry

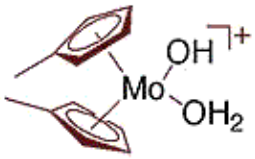
Member, Materials Science Institute

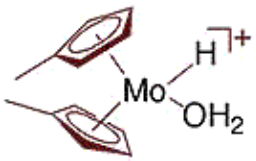
B.S., Purdue University, 1975. Ph.D., California Institute of Technology, 1979 (Harry Gray). Honors and Awards: Alfred P. Sloan Fellow, 1986-88. At Oregon since 1985.

Principal Research Interests:

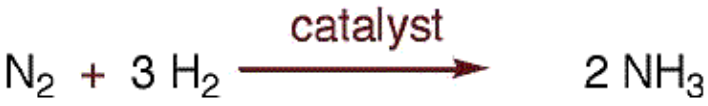
The research in Tyler's laboratory focuses on mechanistic organometallic chemistry, polymer chemistry, catalysis, and photochemistry.

In one project, we are studying aqueous phase homogeneous catalysis. Our group is using its expertise in synthesis to modify organometallic catalysts so they are water-soluble. The reason for doing this is that water is an environmentally benign solvent, so there is a big push to convert many catalytic processes from organic solvents to water. One overall goal of our research is to investigate differences in the reaction mechanisms between water and organic solvents. Two of the catalysts we are studying are shown below.

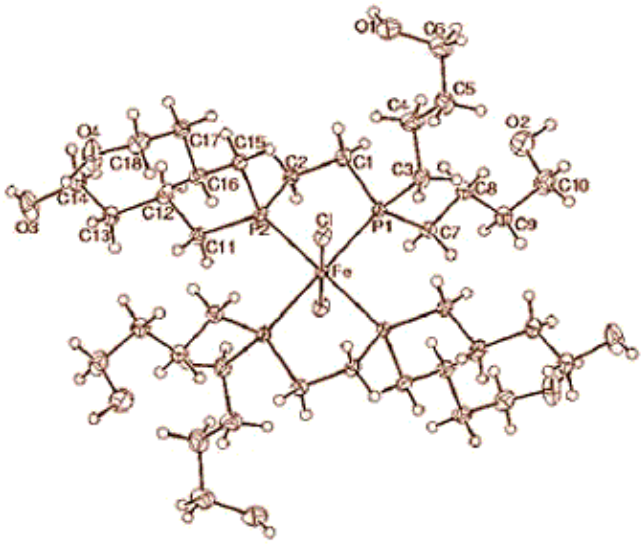




These complexes are excellent catalysts for nitrile hydration, olefin polymerization, olefin hydration, carbonylations, and assorted C-H bond activation reactions - all in aqueous solution. Another reaction under investigation is the reaction of nitrogen and hydrogen to form ammonia at low temperature using water-soluble organo metallic and coordination complexes as catalysts in aqueous solution.

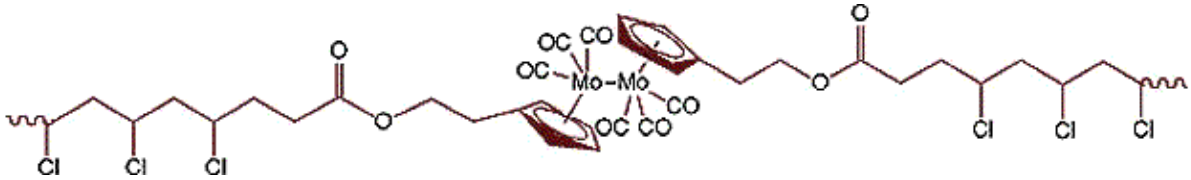


A variety of complexes are being investigated as catalysts for this transformation, among them complexes of the type trans-Fe(P2)2Cl2, where P2 is a chelating, water-soluble phosphine. The crystal structure of the trans-Fe(DHBuPE)2Cl2 complex, a particularly promising catalyst, is shown below:

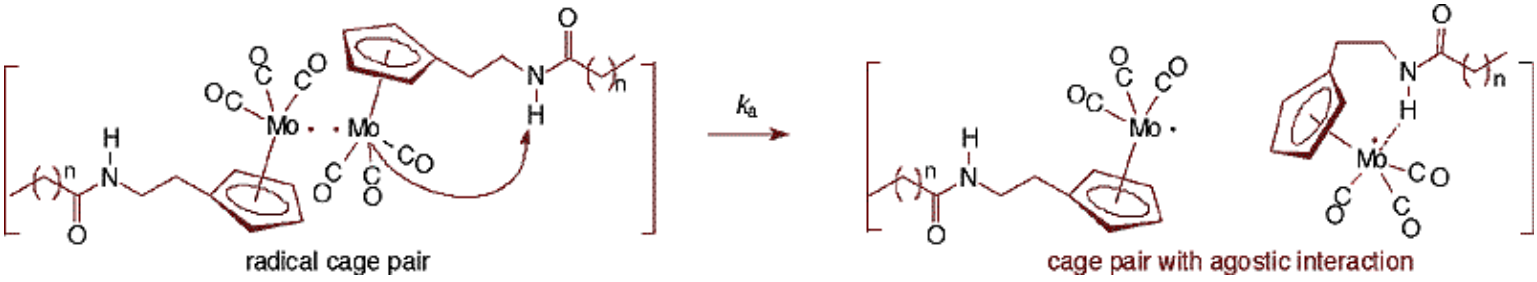


Yet another project in this general area is our synthesis of water-soluble phosphine complexes that reversibly bind dinitrogen. Dinitrogen is a major contaminant in natural gas and our research is aimed at finding complexes that bind dinitrogen at high pressure and release it at low pressure. Such complexes could potentially be used as scrubbers for dinitrogen in natural gas.

Another major effort in our laboratory is the synthesis and study of polymers that are photochemically degradable with visible light. We accomplish this by incorporating metal-metal bonds into the polymer backbones. The metal-metal bonds cleave homolytically when exposed to visible light, and the result is cleavage of the polymer backbone. The example below is a photochemically degradable poly(vinyl chloride).



Photochemically degradable polymers have many potential uses in environmental applications, in medicine, and in materials science. Current research is focusing on (1) the role that stress plays in accelerating the photochemical degradation of polymers and (2) the mechanisms of photo degradation catalyzed by transition metal complexes. A prime concern is to find a way to control the rate of photodegradation. Our work suggests that the ³radical cage effect² is important in determining the rate of polymer decomposition. To probe the cage effect, we are doing femtosecond time-scale laser pump-probe studies on a variety of polymers and oligomers to try and find a correlation between the magnitude of the cage effect and the rate of photodecomposition. Our mechanistic investigations of the radical cage effect have led to many fundamental discoveries, such as an example of ³in-cage² radical trapping by an agostic hydrogen interaction:



radical cage pair

cage pair with agostic interaction

In yet another project our group is attempting to ³split² water photochemically into hydrogen and oxygen using organometallic photosensitizers. (The water-splitting reaction is one possible method for converting solar energy into usable chemical energy.) In connection with this project, we are studying the photochemistry of a variety of solid-state perovskite materials as well as a number of organometallic oxide complexes. These materials form H2 and O2 when irradiated with ultraviolet radiation, and one aspect of our research is aimed at getting these reactions to proceed with visible light. A second goal is to study the mechanism of the multielectron transfer reactions that yield the hydrogen and oxygen products.

Selected Publications:

Investigation of the Origin of Tensile Stress-Induced Rate Enhancements in the Photochemical Degradation of Polymers. Rui Chen, Myungok Yoon, Arwyn Smalley, David C. Johnson, and David R. Tyler, J. Am. Chem. Soc., 2004, 126, 3054-3055.

Aqueous Phase Organometallic Catalysis Using (MeCp)2Mo(OH)(H2O)+. Intramolecular Attack of Hydroxide on Organic Substrates. Kerry L. Breno, Michael D. Pluth, Christopher W. Landorf, and David R. Tyler, Organometallics 2004, 23, 1738-1746.

H2 Activation in Aqueous Solution: Formation of trans-[Fe(DMeOPrPE)2H(H2)]+ via the Heterolysis of H2 in Water. John D. Gilbertson, Nathaniel K. Szymczak, and David R. Tyler, Inorg. Chem., 2004, 43, 3341-3343.

Radical Cage Effects in the Photochemical Degradation of Polymers: Effect of Radical Size and Mass on the Cage Recombination Efficiency of Radical Cage Pairs Generated Photochemically from the (CpCH2CH2N(CH3)C(O)(CH2)nCH3)2Mo2(CO)6 (n = 3, 8, 18) Complexes. Schutte, E.; Weakley, T. J. R.; Tyler David, R. Journal of the American Chemical Society 2003, 125, 10319-10326.

Photochemically degradable polymers containing metal–metal bonds along their backbones. David R. Tyler. Coord. Chem. Rev. 2003, 246, 291-303.

Organometallic Chemistry in Aqueous Solution. Hydration of Nitriles to Amides Catalyzed by a Water-Soluble Molybdocene, (MeCp)Mo(OH)(H-2O)+. Kerry L. Breno, Michael D. Pluth, and David R. Tyler. Organometallics 2003, 22, 1203-1211.

Additional Publications

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lynde@oregon.uoregon.edu

National Science Foundation: Integrative Graduate Education and Research Training Program

New Materials for Electronics and Optics through Control of Nanoscale Structure

The IGERT program offers a nationally-unique, comprehensive package of new and tested approaches to graduate education in materials chemistry and physics. It is designed to prepare the next generation of graduate students for the challenges of an increasingly interdisciplinary and rapidly evolving research and development arena. The research and education activities of this IGERT program are unified by the study of the structure/property relationships in electronic and optical materials whose properties are dominated by their nanoscale structure. The proposed research builds upon established activities in three major thrust areas to address the:

Synthesis and Properties of Superlattice Materials

Preparation and Study of Metal and Semiconductor Nanoparticles, Quantum Dots and Assemblies

Fabrication and Properties of Molecular Assemblies

These research topics provide outstanding opportunities for interdisciplinary graduate training because both the chemistry and physics of "short length scale" systems are intertwined. The collaborative/interdisciplinary programs within MSI will provide IGERT fellows with unusually diverse research training because the activities combine elements of electronic structure theory, chemical approaches to new structures, materials synthesis, nanostructure characterization adn detailed physical investigation. IGERT students involved in this research will naturally develop an excellent understanding of how the concepts and approaches of their core discipline interrelate with those of complementary discipline. Our student-focused program is designed to address three goals:

- help each student acquire diverse, adaptable and portable technical skills and the knowledge base to succeed in rapidly evolving career markets, ·
- help each student develop the critical thinking skills necessary to solve complex problems and understand new phenomena, and ·
- provide each student with comprehensive career training - development of professional skills, exposure to many career opportunities and training tailored to specific career paths.

Students accepted into the IGERT program receive generous fellowships and tuition waivers for multiple years, and substantial travel and research funds to foster creative, independent projects.

IGERT fellows will participate in multidisciplinary course work incorporating substantial hands-on experience with state-of-the-art techniques, as well as receiving training in scientific communications, ethics and other necessary tools of the trade.

Students will have the opportunity to for internships in industry, government, education and non-government organizations. We wish to encourage students to apply their knowledge in internships in the electronics and optics industry where engineering and physical sciences have become increasingly interdependent . This initiative has received wide-ranging support within the University and among our industrial affiliates because it provides a multidisciplinary research experience, stimulates industrial/academic relations and prepares students to be successful participants in diverse and changing job markets.

For more information on the program contact
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Mark C. Lonergan

Associate Professor
Physical & Materials Chemistry

Member, Materials Science Institute
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B.S., University of Oregon, summa cum laude, 1990. Ph.D., Northwestern University, 1994 (Mark A. Ratner and Duward F. Shriver). Postdoctoral: California Institute of Technology, 1994-96 (Nathan S. Lewis). Honors and Awards: National Science Foundation Predoctoral Fellow, 1990-93; A.A. Noyes Postdoctoral Fellow, 1995; ACS/Proctor Gamble Graduate Award in Physical Chemistry, 1995; Dreyfus New Faculty Award, 1996; National Science Foundation CAREER Award, 1997. At Oregon since 1996.

Research Interests:

Our research program is based on the discovery and quantitative understanding of interfacial electron transfer processes that depend on applied bias in a complex, nonlinear and often asymmetric way. This pursuit is at the heart of efforts to identify and control novel systems that enhance and/or mimic the behavior of conventional semiconductor interfaces, which form the basis for nearly all present day microelectronic devices. An important element of our approach is to understand how the unique chemistry of "new" materials manifests itself in interfacial charge transfer processes. Our studies over the past five years have focused on conjugated or "conducting" polymers where we have been working on three major projects that all draw in some way on the unique redox (doping) chemistry of conjugated polymers relative to more traditional inorganic conductors. Three major areas of research are: (1) Electron transfer at inorganic semiconductor | conjugated polymer interfaces; (2). Polyelectrolyte mediated redox chemistry and inter-faces between dissimilarly doped conjugated polymers; (3) Electron transfer at nanostructured semiconductor interfaces. For more information, see the lab web site at http://wwwuoregon.edu/~lnrgn

Selected Publications

M. C. Lonergan, "A Tunable Semiconductor Diode Based on an Inorganic Semiconductor | Conjugated Polymer Interface," Science 278, 2103-2106 (1997).

F. E. Jones, B. P.Wood, J.A. Myers, C. Daniels-Hafer, and M. C. Lonergan, "Current transport and the Role of Barrier Inhomogeneities at the High BarrierÊ n-InP | Poly(pyrrole) Interface," J. Appl. Phys. 86, 6431-6441 (1999)

B. L. Langsdorf, X. Zhou, M. C. Lonergan, "Kinetic Study of the Ring Opening Metathesis Polymerization of Ionically Functionalized Cyclooctatetraenes," Macromolecules 34, 2450-2458 (2001).

M. C. Lonergan and F. E. Jones, "Calculation of Transmission Coefficients at Non-Ideal Semiconductor Interfaces Characterized by a Spatial Distribution of Barrier Heights," J. Chem. Phys. 115, 443-455 (2001).

C. Daniels-Hafer, M. Jang, S.W. Boettcher, R. Danner, and M.C. Lonergan, "Electrochemical Tuning of Charge Transport at the interface between Indium Phosphide and a Polypyrrole-phosphomolybdate Hybrid", J. Phys. Chem. B 106, 1622-1636 (2002).

M.C. Lonergan, C.H. Cheng, B.L. Langsdorf, X. Zhou, "Electrochemical Characterization of Polyacetyelene Ionomers, and Polyelectrolyte Mediated Electrochemistry Toward Interfaces Between Dissimilarly Doped Conjugated Polymers", J. Am. Chem. Soc. 124, 690-701(2002).

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