

COLLEGE OF

*A special issue
for prospective
students*

WINTER 1992

SCIENCE RECORD

Students benefit from faculty authors

Students at Oregon State University benefit in a unique way from the presence in the classroom of science professors who have written textbooks. Recently, three new, excellent texts for undergraduate courses have been published by six OSU College of Science faculty.

The photo on this page comes from the cover of *Biology: The Network of Life* (HarperCollins Publishers), a new college textbook just published by Michael C. Mix, Paul Farber, and Keith I. King, three OSU professors. Mix, chair of the Biology Program, and King teach biology; Farber, chair of History, teaches history of science.

Gifted teachers sometimes become textbook authors as a way of communicating their own enthusiasm for a subject and very often out of frustration with existing texts. In the case of *Biology*, the authors felt that too many biology textbooks and courses emphasize facts, vocabulary, and memorization rather than the scientific process.

Biology (800 plus pages) offers a new approach. "Students learn how scientific inquiry and process are used in solving problems," says Professor Mix. "We hope that our text will provide students with the background necessary to become scientifically curious and literate on biological issues." The new text is now used in introductory biology courses for non-majors at OSU and at many other colleges.



See page 3

UNDERGRADUATE MAJORS & PROGRAMS

Phone 503/737-

Atmospheric Sciences	-4557
Biochemistry and Biophysics	-4511
Biology	-2993
Botany & Plant Pathology	-3451
Chemistry	-2081
Entomology	-4733
General Science	
Earth Science	-1201
Environmental Science	-4811
Other	-4811
Geography	-1201
Geology	-1201
Mathematical Sciences	-5136
Mathematics	-4686
Microbiology	-4441
Physics	-4631
Zoology	-3705

PRE-PROFESSIONAL PROGRAMS

-4811

Pre-Elementary Education
Pre-Dental Hygiene
Pre-Dentistry
Pre-Medical Technology
Pre-Medicine
Pre-Nursing
Pre-Occupational Therapy
Pre-Optometry
Pre-Physical Therapy
Pre-Podiatry
Pre-Veterinary Medicine

Science Record

College of Science
Oregon State University
Kidder Hall 128
Corvallis, OR 97331-4608
Phone (503) 737-4811

Volume 19, Number 2
Winter 1992

Frederick H. Horne, Dean
George D. Pearson, Assoc. Dean
Richard W. Thies, Assoc. Dean
June Martin, Director of
Development

Eva M. Millemann, Writer

Photos by CMC Photo Service,
E. Millemann, and other sources

Undergraduates at Work

Science majors at OSU have different backgrounds and varied interests but share a keen interest in science and a desire to excel. We are proud of their achievements and want to share some of their stories.



Jennifer Shepherd

A GRADUATE of Astoria High School and a class valedictorian, Jennifer Shepherd is now a junior in chemistry with almost a perfect 4.00 GPA. She attributes her love of chemistry to an excellent high school chemistry teacher. When she enrolled at OSU, she knew already that she wanted to major in chemistry.

She began to do undergraduate research in organic chemistry at the end of her sophomore year with Professor Dwight Weller. She now spends 9-12 hours a week in his laboratory performing syntheses of organic compounds which will be used to help make antiviral agents.

"Faculty members in chemistry are very helpful," she notes. "Everyone knows my name, and if I have a problem, I go right to the professor—they are always willing to help a student."

Jennifer is currently president of the OSU Student Affiliates of the American Chemical Society (SAACS), an active group that coordinates professional and social activities for OSU students in chemistry, biochemistry, and chemical engineering.

"We collect useful information and maintain files on special opportunities for students," explains Jennifer. "We find out more about internships, summer research programs, graduate schools, fellowships, and similar topics of interest. We also organize plant tours, invite speakers to campus, and plan social activities where students can

meet faculty in more informal settings."

As a freshman Jennifer had no problems adjusting to a large university. Living in the dorms during her first two years made the transition easier.

She has little spare time for extracurricular activities. "This is the most difficult year so far," she says. "I am taking five demanding

chemistry classes. If I have some spare time, I try to get together with my friends." She found time to play intramural volleyball during her first two years at OSU, enjoys playing the piano and exercising, particularly aerobics and swimming.

Jennifer's academic achievements have earned her two Milton Harris Scholarships from the College of Science and recently a Barry M. Goldwater Scholarship—"the best thing that's happened to me at OSU," she says. The Goldwater Scholarship will pay a total of \$14,000 during her junior and senior years to cover board and room, tuition, and books. Only three students from Oregon were awarded this national scholarship last year.

She was recently chosen for a 10-week summer research internship at the AT&T Bell Laboratories in New Jersey, an honor reserved for a few select undergraduates throughout the nation. After graduation from OSU next year, she plans to continue her studies at the graduate level in some area of bio-organic chemistry. It's too early at this point to know where she will go, but with her excellent record the choice is hers.



Zachary del Nero

"WHEN I FIRST came to college, the hardest thing for me was not knowing exactly where I was going," says Zachary del Nero, a graduating senior in geography. His words are often echoed by many other students who cannot decide on a major.

Today Zach knows exactly where he is going. After graduation with a B.S. in geography, he plans to earn a master's degree in soil science at OSU and pursue a career in land use management and conservation on Indian lands.

After graduating from Churchill High School in Eugene in 1986, Zach enrolled at OSU with no definite goals except an interest in veterinary medicine—he had worked around dairy farms and horses. At OSU he discovered other interesting possibilities and could not settle on an area of concentration.

"I bounced around a lot at first," he says. "Agriculture, forestry, science, and liberal arts—all held great attraction." Taking time off from school to work at various jobs was probably the best thing he could have done. On his return to OSU in 1990, he was more mature and the decision to become involved in land use and ecological issues was easy.

Zach credits certain professors and events with helping him focus on goals and improve his grades in the last two years.

"Geography professor Phil Jackson gave me a lot of guidance and encouraged me to explore geography," says Zach. "My involvement with the American Indian Science and Engineer-

ing Society (AISES), locally and nationally, is the most important experience of my undergraduate years. When I was growing up, my father always made me proud and respectful of my heritage, but my work with the AISES chapter at OSU has been particularly meaningful, especially our efforts to work with young people at Warm Springs."

As the 1991-92 president of the OSU AISES chapter, Zach is actively promoting ties between the OSU group and high school students on the reservations. AISES members have a close relationship with the Young Generation Indian Club from the Warm Springs Indian Reservation in Oregon. This group has shown a special talent for developing native dances and has performed on campus on two occasions this year.

"My work with the AISES group has provided numerous opportunities for personal growth and valuable contacts with faculty members," says Zach. "Faculty advisers to the chapter, particularly Dean Frederick Horne, are very helpful in suggesting educational and job opportunities."

"My involvement with the American Indian Science and Engineering Society (AISES), locally and nationally, is the most important experience of my undergraduate years."

Last summer, for example, Zach spent two weeks in Alaska with geography professor Charles Rosenfeld and other investigators working on a survey of the Bering Glacier "An incredible experience," says Zach. "The only problem—the organizers underestimated our appetites and did not bring enough food. Dr. Rosenfeld and I lost a few pounds."

During the 1990-91 academic year, Zach worked with oceanography professor Robert Holman digitizing video data taken from sandbars and waves to determine wave breaking patterns and predict changes over time. He was one of 13 OSU Native American students participating in marine science research under a new program sponsored by the National Science Foundation.

Working on various research projects for Professor Al Mosley in crop science has helped Zach develop his keen interest in soil ecology and environmental problems associated with agricultural production.

Through his academic efforts and involvement, Zach has earned several recognitions, including the 1991 J. C. Hunt Memorial Scholarship from the OSU Department of Geosciences and a prestigious A. T. Anderson Scholarship from the national AISES organization. He has found a sense of purpose for his studies, and someday with his professional achievements he will be able to help other young American Indians.



Faculty authors

(continued from cover page)

The two other recent textbooks are *Biochemistry* and *Physics*.

Biochemistry, an 1129-page text for juniors and seniors in biochemistry, was coauthored by Christopher K. Mathews, OSU Distinguished Professor and chair of Biochemistry & Biophysics, and Kensal E. van Holde, OSU Distinguished Professor and Stewart Professor of Gene Research. "My mistake was to tell a publisher's representative what was wrong with most texts for biochemistry," says Professor Mathews. "It took us five and a half years to write the book, and we are now embarking on a revision to be completed in three years." *Biochemistry* is used at approximately 260 universities in the U.S. and Canada.

Kenneth Krane, professor and chair of the Department of Physics, coauthored the fourth edition of *Physics*, a classic, two-volume text used in calculus-based introductory courses in general physics. "I used the first edition of this text by David Halliday and Robert Resnick when I was a freshman in 1961," says Professor Krane. "Four years ago the original authors asked me to join them in producing the fourth edition." Krane has published two other textbooks: *Modern Physics*, a text for sophomores used at 70 universities; and *Introductory Nuclear Physics*, a text for seniors and graduate students used at approximately 100 universities.



Travis Bomengen

TRAVIS BOMENGEN, a senior in pre-medicine, will enter medical school next fall after four very successful years at OSU. He completes his undergraduate career with nearly a perfect 4.00 GPA and with an impressive record of community service.

Although his dad, Robert Bomengen (OSU '66), is a physician, Travis never felt any pressure to go into medicine. "My dad is pleased that I have chosen medicine," he says, "but he bent backwards when I was growing up to let me feel that I could do anything I wanted with my life."

Travis, on the other hand, has wanted to be a physician ever since he can remember. He continues a long family tradition of involvement with medicine. Both his grandfathers were physicians. His mother is a public health nurse, and his sister is studying nursing at Seattle Pacific University.

Travis grew up in Lakeview, a small, Eastern Oregon town of about 2,800, where his dad has practiced since 1973. Travis is a typical Oregonian who loves all sorts of outdoor activities from backpacking and snow skiing to bow hunting and water skiing. He has also built demolition derby cars, winning first and second prizes on two occasions.

An outgoing and enthusiastic young man, he enjoys the rural environment and would like to be a physician in a small town, preferably in Eastern Oregon. He likes to help people and cherishes the idea of a personal relationship with his future patients—a rarity in large clinics or urban medical practices.

"I am not a city kid," says Travis. "Even though I might have missed some exposure to cultural opportunities in a large city, in my opinion living in the country close to nature far outweighs the advantages of city living."

Travis was vice president and then president of the student body at Lakeview High School. At OSU he received the Waldo Cummings Outstanding Student Award in his freshman, sophomore, and junior years; was president of his fraternity, Sigma Phi Epsilon, for a year; and served as summer orientation counselor for freshmen in science. He is currently a teaching assistant in biology.

Last summer he spent two and a half months at the Oregon Health Sciences University (OHSU) in Portland doing computer imaging in a research project designed to transfer computer images from rural medical offices to the university to determine if specialists can make accurate diagnoses by analyzing such images.

At this time, Travis plans to go to medical school at the OHSU. He hopes to spend the first summer after his freshman year in medical school working for the Indian Health Service in Alaska and bringing medicine to isolated Indian communities in that region.



AN EXTRAORDINARY FAMILY

"Extraordinary" is the word most often used in connection with the three Le sisters and their brother, all members of a Vietnamese family who came to the U.S. in 1984. Sisters Ngan, Diem, and Huong, and brother Hieu attended McKay High School in Salem and then OSU. Talented and determined to make it in their new country, they are well on the way to demanding professional careers.

The quiet force behind such determination and success is their mother Nguyen Tran, now a

librarian at the Salem Public Library. The family was sponsored by an uncle who came to the U.S. in 1975 and is now an elementary school teacher. The father, whom the three youngest children hardly knew when they became separated, was allowed to join the family last year after spending almost ten years in "education camps."

Ngan Le graduated from the OSU College of Science with a degree in biology and highest honors in June 1991 and is now a first-year medical student at the Oregon Health Sciences University (OHSU) in Portland. Last year she was one of the first OSU pre-medical students to be accepted by OHSU.

The other two sisters and brother are currently enrolled at OSU and consistently receiving merit scholarships. Twenty-year-old Diem is a junior in pre-medicine, and Huong Le at 19 a sophomore in pre-dentistry. Brother Hieu is a freshman in electrical engineering.

Talking to Diem and Huong about their education and personal goals is inspiring. They set professional goals early in life for themselves and plan to provide a comfortable life for their parents.

What was it like coming to a foreign country with an entirely different culture and language?

"I had mixed feelings," says Diem, who was 13 at the time. "It was exciting and frightening at the same time. I was excited about the new opportunities for us, but I was afraid because I didn't know any English."

Although English was a problem at first, Diem was allowed into 8th grade after only a few weeks in the newcomers



Diem Le



Huong Le

center. She soon was impressing her teachers with her ability in mathematics and science. In her freshman year in high school she won first place in a math contest at district and state. She also made the national honor society and participated in a math tutoring program for elementary school children.

At OSU Diem has maintained a 4.00 GPA in a rigorous major. "She is one of the sharpest students I have ever had the privilege to advise," says a math professor and adviser.

Outgoing and enthusiastic, Diem once thought that she wanted to be a teacher. But volunteering at Salem Memorial Hospital and learning about careers in high school convinced her that she could do a lot for other people as a physician.

"Some of my friends think that medicine is too large a commitment for a woman," she says. "I don't. I firmly believe that a woman has as much potential as a man."

Younger sister Huong has set dentistry as her goal. A class valedictorian at McKay in 1990, she finds math and science easy subjects, but, like the rest of the family, has worked hard to perfect her English.

"I knew I wanted to be in some medical field," she says. "I volunteered at Salem Memorial Hospital and learned about the different medical professions in high school. I was also impressed by a dentist we met in Salem, and I think dentistry requires some creativity." That appeals to young Huong, who is very creative and enjoys drawing.

Coming to OSU has been a positive and maturing experience for Huong, a bubbly young woman who obviously enjoys her social activities. "I was very

shy in high school and did not have many friends," she says. "College has built up my confidence, and I am more outgoing now. I like everything about OSU—the campus, the courses I am taking, and the teachers."

Such inspiring enthusiasm will readily open doors for these young people, whatever they might decide to do.



A CLASS VALEDICTORIAN and Presidential Scholar from Lebanon High School, Patrick Williams plans to major in general science and earn a Master of Arts in Teaching at OSU. His goal is to teach science and coach tennis and basketball to middle-school students, preferably in Oregon or somewhere else in the Pacific Northwest.

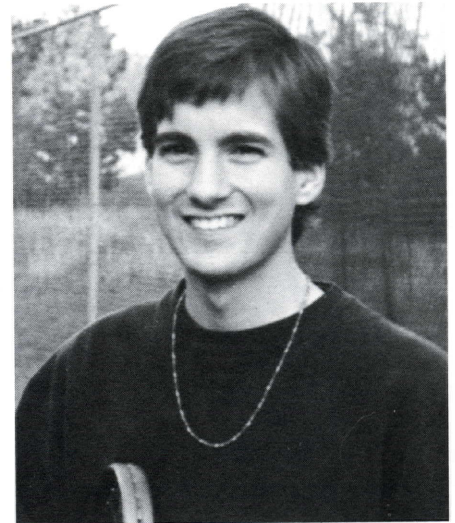
"I would like to work with young people and help them develop enthusiasm and commitment in everything they do—be it science or sports," says Patrick.

An athletic young man with a great tennis game, he has maintained an

"I would like to work with young people and help them develop enthusiasm and commitment in everything they do—be it science or sports."

outstanding academic record at OSU, while also continuing his sports activities. He served as the tennis pro at the Corvallis Country Club last summer and is currently a part-time assistant pro at Timberhill Racquet Club, where he teaches tennis to young and old alike. He also plays on one of the club's top teams, which this past summer made it to the nationals.

Just a few years ago such activity seemed out of the question. When he was 15 and a sophomore, he became seriously ill with aplastic anemia, an unusual condition in which the bone marrow ceases to produce life-sustaining blood cells. His survival depended on receiving a suitable marrow trans-



Patrick Williams

plant from a donor. No one in his family—parents, younger brother, or sister—was a close enough match. When a suitable donor was finally found, it was an OSU student. The successful transplant took place at the Fred Hutchinson Cancer Research Center in Seattle in April 1987.

"It took six or eight months for me to feel really well again," says Patrick. It was only then that his family could return to normalcy. Both Patrick's parents, Charles and Linda, are OSU alumni ('69). They lived in Lebanon for many years but moved to Corvallis after Patrick's graduation from high school.

Patrick has put health concerns behind him, but he actively supports the National Marrow Registry Program and the American Red Cross. "I want to be as helpful as I can," he says. "I speak about my own experience at various events in Oregon and abroad to make people aware of what those agencies do for people. I traveled to Japan twice, fall 1990 and spring 1991, to speak to physicians in support of establishing a bone marrow registry in Japan and to encourage people to become donors."

The future looks bright for Patrick just one year away from graduation.

He has the qualities that make good teachers—great enthusiasm for science, a lot of patience, and much understanding.



Presidential Scholars are chosen for their academic achievements and receive four-year scholarships, which are funded by alumni and friends of OSU.

Lancaster University

... a good choice for science students

Studying at Lancaster University in England during the 1990-91 academic year gave three OSU juniors in science an international perspective and a keener awareness of cultural differences, even in a country where the language presents few problems.

Addie Cole, Aaron Sturgeon, and Troy Plum were able to continue their studies in the sciences at Lancaster University without undue delays toward graduation. Study-abroad programs often result in delays for science students because required courses in one's major are not always available; however, the academic year and the programs at Lancaster are comparable to those offered at OSU.

For Addie Cole, a graduating senior in microbiology, studying at Lancaster was a great opportunity to see some of the western world firsthand. A Korean native who was adopted by her American family (Toledo, Oregon) when she was ten, Addie already has a bi-cultural heritage.

"I wanted to experience a foreign culture," she says, "and everyone says that the best time to travel is when you are in college. I worked hard during the summers and saved money to study abroad."

"It was an opportunity I couldn't pass up," says Aaron Sturgeon, a math major who is also minoring in physics. "Spending a year abroad would be

difficult later on with graduate school and work. In my case it probably slowed my graduation a bit, but I like being a student."

"Spending a year abroad was a way to get away from the environment that shaped me," notes Corvallis High School graduate Troy, a math major who has lived in Corvallis all his life. "Once you start working it's impossible to take off for a year."

All three students were especially pleased with the OSU Financial Aid Office and the way in which all financial arrangements were made before they left OSU.

Lancaster University is similar to OSU but smaller—only 5,000 students. It is on the west coast of Britain close to the English Lake District and just outside Lancaster, a town of 50,000 about three and a half hours' train ride from London. The academic year, which begins in October and ends with final exams in late June, is similar to the OSU format—three terms with four-week breaks between terms. The month-long vacations allow students ample time to travel in Europe.

"Living on campus at Lancaster University was somewhat different," says Aaron. "We lived in dorms, called colleges, which have communal kitchens on each floor. I teamed up with two other students to share the cooking. Classes lasted about four hours a day, and in the evenings we had movies, plays, lectures, and various clubs. In addition, nine pubs right on campus served as gathering places, where it was easy to make friends."

The language was somewhat of a problem at first. "You get in a cab, and this guy sounds like he has a mouth full of potatoes," says Aaron.

Addie also discovered that English was different than what she was accustomed to hear. "Miscommunication was common at first," she says, "so

many of their expressions differ from ours."

She managed to travel with other students all over Europe without any problems, visiting France, Italy, Switzerland, and Russia. "I was so impressed when I met someone in Switzerland who could speak six languages," she remarks. "It made me want to learn at least another language well."

Aaron and Troy were active in the Mountaineering Club, with Troy concentrating on rock climbing and Aaron on skiing. They traveled together during breaks, mainly by rail, and during spring break they went to France with the Lancaster University ski team.

What was the greatest thing about studying at Lancaster University?

"The people I met," says Aaron without hesitation. "It was interesting to find out firsthand that not everyone in the world regards Americans in a favorable light. At times I felt that I was held personally responsible for U.S. government policies."

"It has made me re-evaluate my goals," says Addie. "I originally thought about a career in a health-related field. Now I would like to be involved in some type of international career."

"I enjoyed the people I came to know, not only through the clubs in school, but also those I met in my wanderings through Europe," says Troy. "Traveling from country to country, it was interesting to notice the differences as well as the way in which Europe is moving towards a united Europe."



Addie Cole in Edinburgh



Aaron Sturgeon (left) and Troy Plum

Gymnasts excel in science too...

It is possible for students to participate in a time-consuming sport like gymnastics and still succeed in science, with its demanding course work. Senior Donna Linder and sophomore Kelly Baker can attest to that. They are both top students and members of the OSU gymnastics team, which last year ranked 4th in the nation while averaging an academic grade point of 3.61—the highest GPA of any college team in any sport in the nation.

Donna Linder, a biology major and a specialist on the bars, is a three-time

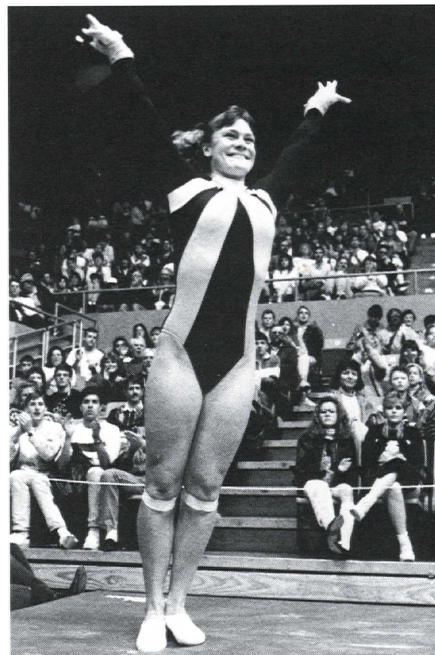
"My dedication to gymnastics helped me focus and taught me to use time wisely."

academic all-America and a Pac-10 all-academic in 1991. She came to OSU on a gymnastics scholarship from Utah, where she grew up. Long hours of practice every day, including Saturdays, throughout junior high and high school have paid off.

"My dedication to gymnastics helped me focus and taught me to use time wisely," says Donna. "It has also paid for my college education. There are other things I want to accomplish in my life, although I will always be involved with gymnastics in some way."

A well rounded young woman with many interests, Donna loves science but also enjoys drawing and literature. She is the "team artist," often doing pencil sketches of gymnasts and even designing team Christmas cards that coach Jim Turpin sends to parents and boosters.

Although gymnastics is a very important part of her life at this time, Donna is looking ahead and seriously considering a career in medicine. She is fulfilling requirements for pre-medicine and also completing prerequisites for a master's degree in business. If she



Mike Shields Photo

Kelly Baker

decides not to pursue medicine, she would like to be involved in the administration of a medical facility or a research establishment.

Kelly Baker, also a biology major and a vault specialist, came to OSU on a merit scholarship from Federal Way High School, Washington, and joined the team as a walk-on. Last year she suffered a tendon injury and almost retired, but she decided to return to her team this year and concentrate just on vaulting. In the past she has scored 9.8 several times. Although she is just a sophomore, she has made academic all-America and all-Pac-10. She has no definite plans yet for a career although she is interested in environmental problems and solutions.

"OSU has been a great place to start school because of its homey atmosphere and the gymnastics meets," says Kelly. "Coach Jim Turpin and his staff make us feel like a big family."

Both Donna and Kelly have found competing at OSU a thrilling experience, mainly because of the thousands of fans who turn out for home meets at Gill Coliseum.

The auspicious beginning of the '92 season saw the OSU team outperform UCLA, which once dominated the conference, and upset No. 1 Utah.



Mike Shields Photo

Donna Linder

An active AISES chapter gains national attention

About forty OSU students are active members of the local chapter of the American Indian Science and Engineering Society (AISES). This national organization seeks to increase the number of American Indian scientists and engineers in the nation and to advance American Indians in all fields.

Fifteen AISES members and five OSU faculty advisers returned from the National AISES Conference last fall (Albuquerque, Nov. 7-10) proud of their accomplishments and happy with the recognitions received.

The OSU Chapter, one of 78 across the nation, walked off with the second highest recognition—runner-up for the Stelvio J. Zanin Distinguished Chapter Award and the \$500 prize—for its efforts in promoting education among Indian tribes and in helping Indian students of all ages to succeed in science and technology.

The Annual AISES National Conference brings together more than 3,000 American Indian students and profes-

sionals, as well as representatives from major U.S. corporations, government agencies, and universities to discuss important concerns and to recruit young American Indians.

"The four days spent at the AISES National Conference were most valuable," notes Zach del Nero, a senior in geography and current president of the OSU chapter (story on page 3). "It was four days of emotional, spiritual, academic, and leadership recharging."

The highlight of the conference is the presentation of scholarships and awards. Three chapter members, Ronald Albright, Zach del Nero, and Bodie Shaw, were each awarded \$1,000 A. T. Anderson Memorial Scholarships at the conference. Frederick Horne, dean of the College of Science, who has personally guided the OSU AISES group since the chapter's revival three and a half years ago, was honored by the students with a lifetime Sequoyah Fellowship, awarded only to individuals who have made a distinguished personal contribution to AISES.

Several student clubs and pre-professional societies play an important role in student life:

- Science Student Council
- Student Affiliates—American Chemical Society
- Entomology Club
- Geology Club
- Mathematics Club
- Microbiology Club
- Society of Medical Technologists
- Society of Physics Students
- Zoology Club
- Pre-Dentistry Club
- Pre-Medicine Club
- Pre-Nursing Club
- Pre-Therapy Club
- Pre-Veterinary Club

Re-established in the fall of 1988, the OSU AISES chapter has flourished through the tireless efforts of dedicated faculty advisers. Members meet weekly to provide reciprocal support and mentoring and to establish a network with Indian schools and communities. The chapter sponsors speakers, cultural events, seminars, and socials to foster interaction with faculty and administrators as well as understanding between Native Americans and members of other cultures.



OSU AISES group on stage at national meeting (l. to r.): Len Weber, Toby Martin, Phil Lane, Sr., David Liberty, Jeff Gonor, Tom Downey, Gerald Kary, Judith Vergun, Mae Spears, Marietta Cook, Lloyd Mitchell, Junie Garnenez, Andy Slate, Dean Fred Horne, Zach del Nero, Renae Jake, Robin Slate, Sandy Manuelito-Kerkvliet.



College of Science
Oregon State University
Kidder Hall 128
Corvallis, OR 97331-4608

Non-Profit Org.
U.S. Postage
PAID
Permit No. 200
Corvallis, OR 97331