

The PHYSICS MAJOR



SONOMA STATE UNIVERSITY

DEPARTMENT OF PHYSICS AND ASTRONOMY
2001

Two New Profs Joining the Department



Dr. Enrique Izaguirre

I was born in the small town of Neuquen near the Andes mountains in Argentina. I earned a technical degree in electronics and mechanics and then moved to the capital to study physics at the University of Buenos Aires. My research was in electro-optical devices with nonlinear feedback. Upon completing my M.S. I was invited to spend a summer at Drexel University in Philadelphia, where I received my Ph.D. in physics (it turned out to be a little longer visit) with a concentration in quantum optics in 1997. My thesis was "The Dynamics of Continuous Wave Dye Lasers."

I worked as a teacher and consultant for a couple of years until I joined the W.M. Keck Center for Molecular Electronics at Syracuse University, where I worked on three-dimensional protein-based memories.

I am interested in biomolecular electronics, UV lasers and the development of instrumentation for nanotechnology. I will continue in these applied physics fields after I join the faculty at SSU.

I will continue working on ultraviolet light sources, concentrating on metal vapor lasers excited by radio frequency fields. This particular type of excitation offers an alternative method of plasma generation where the electrodes are located outside the plasma tube. This arrangement avoids the contamination of the metal-gas mixture giving a laser tube a longer life time and better efficiency and signal-to-noise ratio, and it offers better characteristics than the previous designs (pulsed or hollow cathode CW discharge). There are several metal vapor lasers that have strong UV lines in

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Dr. Brock Weiss

I was born and raised in a small town in southeastern Pennsylvania. I took the "long road" to finish my B.S. in physics, which I received from Pennsylvania State University in 1990. It was while working on my master's degree that I acquired a love and appreciation for both teaching and research. I worked with Dr. Paul Cutler and Dr. Nicholas Miskovsky. The project involved numerical calculations of electron field emission energy distributions from atomically sharp metallic emitters (ask me about the work — I will be happy to tell you about it!)

After I earned my M.S. in 1994 I had the opportunity to be a temporary instructor at Penn State's Altoona campus. This was my first experience to be in charge of my very own physics course. I loved it immensely! I then entered the Ph.D. program in the Materials Science group at PSU. I was very fortunate to work with Dr. Andrzej Badzian who is an internationally recognized expert in diamond thin film growth and technology. In addition to his scientific expertise he is also a phenomenal person. Under his guidance I completed my Ph.D. dissertation, entitled "Growth, Characterization and Electron Field Emission Measurements from Thin Film Cold Cathode Materials Fabricated by a Modified Microwave Process" (Ask me about the work — I will be happy to tell you about it!) In July of 1999 I left Penn State to work as a postdoctoral fellow at the University of Puerto Rico in the laboratory of Dr. Gerardo Morell. During my time in Puerto Rico I have extended my research interests

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An Interview with Dr. Poland

Jerilynn Cocchiara

I walked into Dr. Poland's office, where he was busily working at his computer, full of excitement for the honor of interviewing him in order to write an article for the *Physics Major*. Dr. Poland retires this year, and we will not have the privilege of his wealth of experience as a teacher and administrator after the Spring 2001 semester. I asked about what kinds of changes he has seen, his favorite subjects to teach, what he will miss the most and least about his career, his vision for the future, what he'll do with all the time off, and what advice he has for students and faculty. Here are the highlights of our discussion.

Dr. Poland got his Ph.D. in physical chemistry with a minor in physics from the University of Wisconsin in 1963. It was there that he got his first taste of teaching as a teaching assistant in chemistry. He then did postdoctoral research work at the National Bureau of Standards in Washington, DC and taught chemistry at Georgetown University before coming to Sonoma State College in 1965. Needless to say, he has seen many changes and been an integral part of the evolution of the Department of Physics and Astronomy.

Dr. Poland, Dr. Garrison Sposito, Dr. Gene Schaumberg and Dr. Bob Holmes were all hired at the same time into the physical science department. When he was asked if he would help establish the new physics department, he quickly chose physics over chemistry and joined Dr. Sposito in founding what would become the Department of Physics and Astronomy. Dr. Poland and many other faculty came to SSU because there was room to make changes and progress without waiting for older faculty to leave. In fact at the time he had the feeling that new faculty were hired at SSU with the expectation of bringing new ideas, the antithesis of larger, more established schools.

Since the 1960s Dr. Poland has been privileged to see growth in the popularity of the Department. Some of Dr. Poland's favorite classes to teach have been the second and third semesters of introductory physics, and the accompanying labs. His specialty is the Physics 316 Modern Physics Lab, which no one else has taught for years! In fact he developed and wrote the experiments for 316, and wrote some quantum physics notes that are invaluable tools for students. Another of his favorite classes, for which he developed the early version, is the electronics course.

Dr. Poland also helped to establish some of the earliest relationships with industry in our area. He was very active in making purchasing decisions for equipment for the machine and wood shops. He got help from companies such as OCLI in the form of advice and information about the best shop equipment to buy and the best way to use that equipment. Now SSU and the Department enjoy the support and involvement of many high tech companies in Sonoma County.

When I asked Dr. Poland what he will miss the most, his eyes lit up as he smiled, leaned back in his chair, and said "The people of course, the students and faculty." He talked about the students first, about how the students always bring a new challenge so teaching the same subject never gets boring. They bring fresh attitudes and ideas, and what a pleasure it is to watch students grow in their understanding. Then he talked about how much he'll miss the faculty, especially within the Department. After all, he has known most of them for many years. They have brought fresh ideas and divergent views, but have learned to accommodate their differences and keep unproductive tensions to a minimum. This extends to the whole School of Natural Sciences, where faculty have shown interest in each other's programs, recognizing the needs of other departments. On the subject of what he'll miss the least he talked about the university's administration evolving into a remote bureaucracy removed from instruction. For example almost all college administrators were formerly faculty, but now they are more business managers, lacking the hands-on student-relating experience. And at the state level there is a drift away from state-supported to "state-assisted" education, forcing schools to focus more on fund-raising than on what's best for education.

For the future of education, Dr. Poland sees the virtual classroom on the verge of evolving, making education more widely available than ever before. But his advice to the student is very down to earth. He advises taking chemistry because a lot of applied physics is related to materials, and astrophysics uses chemistry a great deal too. He emphasizes that an important quality of a successful physics major is the desire to really understand the concepts of physics and the mathematics, and to troubleshoot experiments because this gives personal ownership of ideas and

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Lynn Cominsky, Michelle Curtis, Julia Maisen,
Duncan Poland, and Joe Tenn.

makes you feel like a “real” physicist. Learn to read formulas like sentences, understanding the symbolic conveyance of concepts in the same way words communicate ideas. And try to find something interesting in every course. It comes back to ownership, he says, and understanding in whatever way you feel comfortable.

As for Dr. Poland’s future plans, he is looking forward to just being a grandpa and spending more time with his wife and family. He has a daughter, a son, and two grandsons, Ethan, 3, and one-year-old Jared. Of course reading for pleasure has been elusive and many a fine book is waiting on the shelf, as well as fishing trips on the McCloud and Sacramento Rivers near Mount Shasta.

We’ll miss Dr. Poland’s wealth of experience both as a teacher and administrator; his natural sense of humor is always refreshing. He has been dedicated to this school and the students, helping to build a firmly established and popular Physics and Astronomy Department here at SSU. He deserves a big “Thank you!” So next time you go looking for Dr. Poland you might find that he’s traded his briefcase for a tackle box, and left a sign on the door: “Gone fishing.”

A Message from Duncan Poland

Dear Alumni: Those of you who couldn’t attend the 6th reunion missed a wonderful evening. My remarks and acknowledgments were inadequate to the occasion. Joe Tenn, Mark Robinson (*93), Gordon Spear, and the others on the committee organized a special evening. They did an outstanding job.

In my small part I forgot much of what I wanted to say. I feel that I have been extremely lucky in coming to Sonoma County in 1965, in coming to Sonoma State University (then College), and in being associated with so many fine faculty that have been part of Physics and Astronomy. They have all been so hardworking and effective as to put my efforts to shame. The least I could do was take on the drudgery of the department chairship.

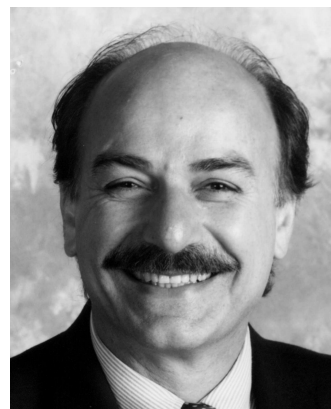
I used to worry about being bored after a few years of teaching the some courses repeatedly. What I found was there is never any end to what one can do to improve one’s teaching. Furthermore, I discovered that you students kept changing. It has been a delight to me that so many of you came to SSU so motivated to learn or soon developed that attitude while here. You have provided me the stimulation, mostly positive, to keep me challenged and happy. Every so often something occurs to bring some pleasant memory of you to mind and I thank you all for those. I feel proud to have been associated in some way with all the wonderful things you have accomplished. Please keep responding to the questionnaires.

I have also felt blessed with the excellent support provided by Steve Anderson, our current Equipment Technician, and by Kent Nelson before him. It is difficult to exaggerate the contributions that Steve has made to the academic programs in physics and astronomy here. I wish we had more help for him.

I also want all of you alumni to know how much the department appreciates your donations of money and equipment. They have been a vital support for the

quality of our instruction. I especially wish to thank all of those who made a special contribution to the department on the occasion of my retirement. You alumni donors have also been joined by many in the community who are not graduates of SSU, but have also found something worthy of their support here. I assure you all that these donations are put to good use.

I am formally leaving the department, but expect to be like one of its alumni in the future. I leave happy in the belief that the two new faculty joining the department in the fall will ensure even better things lie in the future of the department.



Dr. Rahimi Named Dean

Just as the *Physics Major* went to press Sonoma State University President Ruben Armiñana announced the appointment of Dr. Saeid Rahimi as Dean of the School of Natural Sciences.

The popular physics professor, who won two teaching awards in 1999, has been interim Dean this year. He is known as the prime mover behind the establishment of the Master of Science in Computer and Engineering Science (MS-CES) program that will be offered by the School beginning in Fall 2001.

Dr. Rahimi has overseen the design of new labs for electronics, photonics, and materials which will be established in the remodeled Salazar Hall. These labs, built for the MS-CES program, will also be used by the Department of Physics and Astronomy.

What’s up with the SPS?

Julia Maisen

The people in the Society of Physics Students (SPS) have had an interesting year. At the beginning of the spring semester there was a weekend ski trip to Lake Tahoe with twenty or so participants, consisting of physics majors and their families and friends. There were two fundraisers. A bake sale was very successful, and the second, folder stuffing, earned us two hundred dollars.

Current officers for SPS are Sarah Silva who is co-president with Ed Ott, Leif Noble, treasurer, and Lorie Siebler, secretary. Meetings continue to be on varying Wednesdays at noon in the physics lounge or electronics lab, depending on who shows up.

Finally there is a new SPS website: <http://perry.sonoma.edu/sps/>, created by Sarah Silva. On it can be found information on the club officers, members and upcoming events. Some favorite links can also be found there.



A Successful Reunion

The Department of Physics and Astronomy held its sixth reunion in the Commons on April 21. Seventy alumni, students, faculty, friends of the Department and their guests enjoyed good food and Sonoma County wine and each other's company.

The reunion had two themes: to honor Dr. Duncan Poland on his retirement after 36 years of service to SSU and to celebrate the twenty-fifth anniversary of the dedication of the SSU Observatory.

Dr. Joe Tenn, Jim Hill ('71), Dr. Chris Ray ('87), Dr. Saeid Rahimi, and Dr. Lynn Cominsky paid tribute to Dr. Poland, and Dr. Tenn showed slides going back to the early years of Sonoma State.

Dr. Gordon Spear, the Observatory's director since the beginning, presented pictures and stories of the first quarter century of the SSUO, with some emphasis on prospects for the future.

The reunion was planned and presented by a committee consisting of Mark Robinson ('93), Chair, Amy Weber Madruga ('97), Claude Plymate ('81), Teresa Bippert-Plymate ('84), Chris Ray ('87), Niles Severy ('71), Lorie Siebler (student), Dr. Gordon Spear, and Dr. Joe Tenn. Photos by Paula Bennett ('86) may be found on the department website.

Sonoma Center for Innovative Education in Science (SCIES) Founded in Department

Dr. Lynn Cominsky

Professor Lynn Cominsky and Dr. Laura Whitlock have founded the Sonoma Center for Innovative Education in Science to serve as an umbrella organization for their NASA Education and Public Outreach grants and the North Bay Science Project site. The total funding for SCIES projects over the next five years exceeds \$5 million. There are currently five ongoing science education projects at SCIES: Space Mysteries, GLAST, Swift, and work in support of NASA's Structure and Evolution of the Universe Education Forum (all funded by NASA), and the state-funded North Bay Science Project. SCIES personnel now include Research Manager Dr. Phil Plait, Scientific Illustrator Aurore Simonnet, NBSP Site Director Sharon Janulaw, and students Tim Graves, Sarah Silva, Michelle Curtis, Mark Fertig and Julia Maisen.

North Bay Science Project (NBSP). The NBSP is part of the California Science Project, an effort by the state to facilitate educators in teaching science topics. NBSP sponsors hands-on workshops to help teachers get a "feel" for the science they teach, knowing that experience is the best teacher of all. The Project has

been enhanced enormously through the aid of Master Teacher and site director Sharon Janulaw, winner of the Presidential Award for Excellence in teaching science and math, who teaches at the local Hahn Elementary School. The website (<http://perry.sonoma.edu/nbsp/>) has more information, including a schedule of upcoming workshops, the second summer institute for science teachers, and a bulletin board forum page in which teachers can ask questions and give each other support.

Space Mysteries. We are developing a series of interactive web-based games to take advantage of students' natural curiosity to build critical thinking and analytical skills. The games are mysteries involving astronomical topics, and the students must determine whodunit (or whatdunit) using real NASA data and tools similar to what real scientists use. The first game, "Alien Bandstand," is now online as a beta-test version at <http://perry.sonoma.edu/learners/mystery3/htmlout>. Two more will follow in the coming months. Space Mysteries are funded by a grant from LEARNERS, a NASA project to enhance science learning through the Internet.

GLAST. The Gamma Ray Large-Area Space Telescope, scheduled for launch in March 2006, is an ambitious NASA satellite built to detect gamma rays from space. Gamma rays are produced in only the most violent or energetic events in the Universe, and are a key to understanding how the Universe behaves. The GLAST EPO project at SSU has many components, including the development of teaching material, two new Space Mysteries modules, a network of telescopes to aid professional astronomers in observing gamma ray bursts (extraordinarily bright flashes of gamma rays whose source is still unknown), a traveling museum exhibit and even a PBS television show. The GLAST website has a lot more information at <http://www-ghost.sonoma.edu>.

Swift: The Swift satellite, scheduled for launch in fall 2003, is named after the speedy bird because it can catch gamma ray bursts within seconds after an event. Swift carries on board an x-ray telescope as well as a more conventional optical and ultraviolet telescope to broaden our understanding of these violent events. Swift EPO at SSU includes a new Space Mysteries module, workshops for teachers to aid in science teaching, and "What's In the News," a multimedia children's current events program which reaches five million children in 32 states and Iceland. The Swift website is at <http://swift.sonoma.edu>.

SCIES sponsors a monthly chat session featuring an expert from the Swift or GLAST team. These chats give students of all ages a chance to talk to real scientists involved with cutting-edge technology and NASA space-based astronomy. The last chat of the 2000-2001 season will be in June 2001. Chats will resume in September 2001 with a new season of experts. For more information, see the website at <http://perry.sonoma.edu/quest.htm>

SEU Forum activities: We have begun a series of activities to support the Education Forum for NASA's Structure and Evolution of the Universe theme area. Our first project was the design, printing and

production of folders of flyers which showcase the various satellite missions within SEU. Almost 4000 of these folders were distributed at national educators conferences. Our next big project will be to define a multi-media “kit” of educational materials that can be distributed at these conferences next year.

We are always eager to find physics students willing to participate in developing educational materials for SCIES. We are particularly interested in students with web-based programming skills. Please contact us if you want a challenging and fun project!

SCIES Brings New Staff to Department

Michelle Curtis

The Department of Physics and Astronomy has acquired two staff members who bring experience and talent to the work of SCIES (Sonoma Center for Innovative Education in Science).

Aurore Simonnet began working in October of 2000 as a scientific illustrator. Aurore adds a creative flare to physical science and technical illustrations used for the various education and public outreach programs. From diagrams to illustrations, her skills in graphic design, 3-D animation, and web design contribute a diverse scientific perspective.

Aurore became interested in physics and astronomy as a student. At the University of California, Santa Cruz, she developed an individual major entitled “Physical Science Illustration,” expanding on her strengths as an artist. Aurore built her own curriculum, combining both science classes in physics and astronomy and natural science illustration classes. Alongside her physics professor, Don Coyne, she designed her senior project, which consisted of a large poster of the MILAGRO Telescope (located in Los Alamos) and a triptych of three posters showing the evolution of the explosion of a primordial black hole.

The summer after graduating, Aurore worked as an intern for the Search for Extra Terrestrial Intelligence (SETI) League, in New Jersey. She worked on a rendering of their future array of sixteen telescopes. The internship helped improve her skills even more and prepared her to find employment in the field.

Aurore is a native of France who speaks English and French fluently. Aurore recently returned to competitive synchronized swimming, a sport in which she has been active for almost thirteen years. Her website is at <http://www.imaginearts.com/simonnet>.

Dr. Phil Plait is very excited about working on programs that educate people about astronomy and high-energy astronomy. He spent many years as a research astronomer and programmer and now is the research manager for SCIES. Phil has come to Sonoma county from suburban Maryland, where he worked at NASA’s Goddard Space Flight Center. At Goddard, Phil participated in the calibration and use of the Space Telescope Imaging Spectrograph (STIS), an instrument on board the Hubble Space Telescope. He has done research on objects ranging from STIS observations of the first ever brown dwarf discovered (a brown dwarf is an object that is too small to be a star but too big to be a planet) to other Hubble observations of Supernova

1987A, a star that blew up in 1987. Phil has also worked on asteroids, quasars, galaxies, normal stars, dying stars, and stars being born.

Phil received his Ph.D. in astronomy at the University of Virginia in 1994. While there, he helped teach introductory astronomy classes and for three years he ran a nighttime lab where students used binoculars and telescopes to observe the sky. It was during that time that Phil was bitten by the bug to teach astronomy to the public.

Balancing his enthusiasm of public outreach and writing, Phil enjoys spending time with his wife and daughter. Recently he has become more interested in the history of science, including how science has been misused and misrepresented. “As television and movies have become better and better at shaping our views of the world, it is becoming more and more important that people understand what it means to be scientific.” To that end, he created the Bad Astronomy website at <http://www.badastronomy.com>, where he discusses myths and misconceptions about astronomy in an informal and humorous way. On the website you’ll find big-budget movie reviews, personal essays, and links to even more information about astronomy.

Phil brings his experience in teaching and writing about astronomy to SSU, where he will use them to help create workshops and interactive astronomy-based games to help teachers relay to their students the excitement and interest in astronomy that he feels.



Lindsley Wins Newkirk Award

Linda Lindsley, a junior transfer student from College of the Redwoods in Eureka, has won the fifth Horace L. Newkirk Assistantship.

She reports, “It was wonderful, thanks to the Newkirk Fellowship, to get to help Dr. Gordon Spear with his Physics 116 lab this semester. Since my goals for the future include teaching physics, it has been a great opportunity to exercise those skills that will, hopefully, benefit many students in the future. The classroom atmosphere and being asked questions regarding the laws of physics in the various experiments was also very beneficial in reinforcing my own knowledge of physics.”

“I would like to thank Nadenia Newkirk, once again, for this opportunity to further my education in such a beneficial way. It has been a great experience, one that will remain with me for many years to come.”

NILES SEVERY ('71) teaches physics, engineering, and mathematics at Napa Valley College. He is the director of two projects run by consortia of community colleges: the Network Training Academy Collaborative and the Certified Software Developer Specialist 2+2 Collaborative. He earned an M.S. in geology at the University of Colorado.

Donations Appreciated

Private donations remain extremely important to the Department of Physics and Astronomy at Sonoma State University. Donations are the sole support of the Department's public programs, they fund the Horace Newkirk Student Assistantship, and they allow some equipment purchases.

This year the Department saw the establishment of two substantial endowment funds and the augmentation of a third. Charles and Norma McKinney, longtime attendees and supporters of the "What Physicists Do" series, established an endowment fund to support the series and other public programs of the Department. According to the series director, Dr. Joe Tenn, "Income from the endowment will guarantee survival of the series, and if the other donors continue their support, the endowment income will enable us to bring more speakers from beyond the Bay Area. We should see a few more such speakers next year." A continuing source of support is the Science at Work endowment fund established by John Max several years ago.

Dr. Tenn established an endowed scholarship in memory of his parents. The Sol and Edith Tenn Scholarship will be awarded to an entering physics major and may be renewed for up to four years provided the recipient makes progress toward a degree in physics and maintains grades in the top one-fourth of physics majors. According to Dr. Tenn, "My parents arrived in this country as refugees with no money, no education, and speaking no English. Thanks to scholarships I was able to get a good education, and thanks to that education, I didn't need the inheritance they left me. I want to commemorate them by helping other students."

This year Nadenia Newkirk made a substantial addition to the Horace Newkirk Student Assistantship fund, which she established earlier in memory of her father. The fund provides an assistantship to an outstanding physics major each year. The winner does work which helps the department and furthers the student's education.

Other donors to Department funds this year:

#63851 **Public Programs:** David Chapman (Sunrise Technology), Marvin & Elfi Chester, Dan Benedetti (Clover Stornetta Farms Inc.), Donald J. Farmer, Ed J. Le Du (Forestville Mini Storage), David Gillett, Robert & Lois Gottlieb, James ('71) & Judy Hill, Jeffrey & Tina Kroot, Carl & Linda Marschall, Francis & Patricia Marshall, Charles & Norma McKinney, Jeremy & Laura Nichols, Robert & Bertha Rains, Donald & Ann Rathjen.

#63852 **Physics & Astronomy Equipment & Supplies:** Bill ('96) & Pam Oakes, Katherine L. Rhode ('89), Kenneth A. Ritley ('88).

#63853 **SSU Observatory:** Patrick & Susan Ball, Nabisco Foundation, Jim Pisano ('82), Claude Plymate ('81) & Teresa Bippert-Plymate ('84), Catharine & Henry Sandbach.

#75960 **Physics & Astronomy Scholarship** (endowment): Lynn Cominsky & Garrett Jernigan, Duncan & Marion Poland; IN HONOR OF DUNCAN POLAND ON HIS RETIREMENT: Scott

Fraser ('95), Sean Fraser ('95), Charles & Norma McKinney, Lee Steele ('85), Clyde Underwood ('74), Richard Gary Wong ('75).

#77020 **Science At Work** (endowment for the "What Physicists Do" series): John Max (Max Machinery, Inc.); IN HONOR OF DUNCAN POLAND ON HIS RETIREMENT: Lewis Carroll Epstein.

#85960 **Physics & Astronomy Scholarship** (current): Joe Tenn.

#78380 **Joseph S. Tenn Scholarship** (endowment): Anna Tenn Parker, Ben & Cynthia Tenn.

Special Donations to the Department Reunion: Siana ('97) & Adam Alcorn, Paula ('86) and David Bennett, Robert Bilodeau ('83), Lynn Cominsky & Garrett Jernigan, Gregory ('88) & Ruthi Crawford, Joanne del Corral ('83) & Steve Anderson, Sharon Gilkison Morganelli ('76), James Musto ('88) & Mary Farkas, Claude Plymate ('81) & Teresa Bippert-Plymate ('84), Saeid & Aram Rahimi, Robert & Bertha Rains, Chris Ray ('87) & Stacy Goldring-Ray, Lee Steele ('85), Joe & Eileen Tenn, Ray Ubelhart ('91), SSU Alumni Association.

Equipment Donations

Steve Anderson

This year the Department of Physics & Astronomy has received several major equipment donations which will provide the basis for experiments in the new MS-CES program, undergraduate research, senior design projects and support for new faculty research. We are very fortunate to have this level of support from members of the scientific community.

Photo Luminescence Mapping system (PLM)

This donation, by Lumileds Lighting, was arranged by Dr. Bill Imler. The PLM probes a semiconductor wafer with a 514-nm argon laser. It then collects the photoluminescence from the material (InGaAs or InGaP or others). By translating the wafer with an x-y motion control system and reading the spectrum at each point, the custom software designed by Dr. Imler makes a map of the emission vs. spatial position. By testing the raw wafers for their color, efficiency and spatial uniformity, the system is used for process control and quality control. Dr. Imler designed and built the instrument, which has a cooled photon counting detection system, optical table and high throughput spectrometer. Lumileds, a developer of high power and white light emitting diodes, has replaced it with a unit from BioRad which cost over \$250,000.

Diode Pumped Frequency Doubled YAG lasers

Five DPSS lasers were donated by Pacific Scientific Instruments through its principal scientist, Dr. Richard DeFrez ('80). These tiny lasers may actually replace the argon laser from the PLM system described above. Solid state lasers with diode pumps are much more efficient than ion lasers. A 980-nm laser diode end pumps an Nd:YVO₄ doped YAG crystal which is then frequency doubled from 1064 nm to 532 nm (green) with a barium borate non-linear, second harmonic generating optical element. These lasers can be used for fluorescent pumps and fiber optic experiments.

Auger Spectrometer

This beautiful instrument was donated by Optical Coating Laboratory, Inc. (OCLI) a JDS Uniphase company, thanks to Dr. Said Mansour. It is an all-stainless ultra-high vacuum system with ion and electron beams and a secondary (Auger) electron detector, that can analyze thin films or bulk materials for their elemental composition. It has both turbomolecular and cryo-ion pumping systems! This is the nicest vacuum system we have ever had here, and I am looking forward to getting it up and running in the new analytical lab facilities now under construction in Salazar Hall for the MS-CES program.

I would especially like to thank Professors Saeid Rahimi and Duncan Poland for their work in arranging these donations and am very grateful to the donors for supporting science at Sonoma State.

Izaguirre

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the range of wavelengths (240 to 270 nm) which are of great interest to the electronics industry. The metal vapor laser that I am currently working on is the helium copper bromide laser where gain in several ultraviolet lines has been found. In addition to these interesting aspects, the use of metal vapor lasers in combination with dye lasers to create an anti-Stokes Raman laser has not yet been investigated, and I intend to explore and pursue the development of a laser prototype.

In biomolecular electronics I will continue my work in thin films doped with proteins and organic dyes. Using the Langmuir-Blodgett technique for multilayer film deposition on a substrate, it is possible to create a film where dyes or proteins can be inserted in the different lipid/polymer layers. These multiple layer films have potential applications in semiconductors and photonics devices. For example these films show optical tunneling and light-controlled plasmon excitation. These mechanisms can be used in optical switches and light-controlled modulators. I have a special interest in these films from the theoretical and experimental point of view. On the theoretical side the film self-assembly and quantum properties are challenging problems. On the experimental side the construction of an opto-electronic working device and the corroboration of the theoretical model is a fascinating field which I plan to pursue at SSU.

In industry I designed and constructed several instruments, including fast scanning spectrometers, miniaturescanners, holographic optics, CCD cameras, miniature spectrometers, and photocalorimeters.

While teaching in New York I have had the satisfaction and enjoyment to work with undergraduate and graduate students in different research projects to further their education. I have great expectations for doing research with SSU students, but I want to warn them that they will work like dogs, as I do.

I have a broad taste in music, which ranges from classical music to heavy metal. Also, I enjoy nature and I am an avid climber. My hobbies are working hard (I am a workaholic) and enjoying life to its full extent.

Weiss

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into the hot area of nanotechnology. I am greatly looking forward to joining the faculty at SSU. I plan to continue my research in the areas of diamond thin films and nanotechnology. I hope to attract several hardworking and enthusiastic students to work with me on a variety of projects in these areas. The exciting aspect of my research is that since it is interdisciplinary it can involve people from a variety of backgrounds. I am especially looking forward to teaching a wide range of courses at SSU. I hope I can project my enthusiasm for physics to my students and try to inspire in them, at least, respect for physics. I also hope I can provide my students with the type of positive environment that my mentors provided to me which has allowed me to develop into the scientist and person I am today.

When I am not doing or thinking about my research I enjoy any and all outdoor sports and activities (at the beach or in the mountains), playing pool, listening to music, exercising (running, weight lifting), cooking, travel (a great benefit of academic life), volleyball, and Penn State football. When the opportunity arises I will become one of many happy dog owners.

More Retirements Coming

Dr. Sam Greene has been teaching fall semesters only under the Faculty Early Retirement Program (FERP) for the last four years. Fall 2001 will be his last semester on campus. The versatile professor will, as usual, teach a wide variety of courses, ranging from the popular general education course, Extraterrestrial Intelligence and Interstellar Travel, to the senior course in quantum physics for physics majors.

Dr. John Dunning will go on FERP in 2001-02. He will be here half-time both semesters for the next few years. He will bring his well-known enthusiasm to the descriptive physics course and to the x-ray analysis course for upper division physics majors in the fall.

Students Selected for Summer Research Programs

SSU physics majors continue to be in demand for highly competitive summer research programs. This summer Chris Crosher will investigate problems in materials science at the University of New Mexico, Lorie Siebler will work at the Lawrence Livermore National Laboratory, and Zachary Wiren will do research in physics at Oregon State University.

OCLI Hires Grads

Senior physics major Justin Wolfe will join the engineeringdevelopment program at Optical Coating Laboratory, Inc. upon graduation in May. Now a part of JDS Uniphase, the Santa Rosa firm remains the largest employer of SSU physics graduates. Wolfe, who turned down graduate assistantships from the Universities of Washington and Oregon, is following in the footsteps of Angela Duprez ('00), who entered the prestigious program a year ago, and Cliff Alapa, who graduated and joined OCLI in December.

BRUCE KEMMELL ('72) teaches physics and mathematics at the Southwestern Indian Polytechnic Institute and mathematics, general science, and astronomy at Albuquerque Technical Vocational Institute. He earned his Ph.D. in theoretical physics at the University of New Mexico in 1992.

FRED ARIOLI ('75) is an engineer working on the Space Infrared Telescope Facility (SIRTF) at Lockheed Martin in Sunnyvale.

JOHN PALMERLEE ('85) is a web developer with Cafex Corporation in Larkspur.

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