



# University of Alaska Fairbanks Physics Department

Volume 3, Fall 2006

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## Letter from the Department Chair

This is the third annual newsletter from the UAF Physics Department, in which we provide information on successes within the past year and plans for the future. First an apology and a thank you because for reasons unknown I have failed in the past newsletters to mention those who have graduated and you have been too polite to point it out, even though you should have. We are making amends in this newsletter.



Recommendations for changes to the curricula for the undergraduate BS and BA degrees in physics were received last year

from our undergraduate curriculum committee and in 2005-2006 the department's faculty discussed, revised, and approved it. As department chair, it has been my responsibility to complete all necessary forms and submit these approved changes to the college curriculum committee. This has been done and they are now making their way through curricular review by the UAF Faculty Senate. The first course of the new curriculum was actually started several years ago (PHYS 220, Introduction to Computational Physics), but it will now be a graduation requirement. The next new course will be PHYS 301, Introduction to Mathematical Physics, starting in spring 2007. Both courses are designed for physics majors at the sophomore level. Additional information is provided within. Review of the graduate curriculum remains in its early stages.

The third concentration in the BS Applied Physics degree program, Technical Management, is also moving through the final approval cycle. This program provides a strong dose of courses necessary for entry into the UAF School of Management's graduate degree program in Business Administration (MBA) upon completion of our BS degree.

In other news, Provost Reichardt and Vice Provost Susan Henrichs have officially completed the 2004-2005 Program Review of our programs. This final review, along with the original program review submission, remains accessible at the

Physics Department's home page: <http://www.uaf.edu/physics> - just select "Program Review."

Main points in the provost's review are, in my words: (1) The high quality of the UAF physics programs deserves greater recruiting efforts; (2) Physics Department resources would have to be increased should the College of Engineering and Mines be successful in its goal of markedly increasing its program enrollments; (3) Calculus appears to be the first hurdle that sweeps away potential undergraduate physics majors, for which it is suggested that more students should be directed into 100-level math courses before attempting calculus; (4) Their analysis for our graduate program suggests a higher failure rate than we believe to be true; (5) They do not favor numerous small graduate degree programs within the department, even though they do not require additional resources, versus fewer programs with greater numbers of students; and (6) The student learning outcomes assessment program needs to be strengthened through the inclusion of direct assessment measures. We will be working on the recommendations during this academic year.

Faculty post-tenure reviews in 2005-2006 were carried out for Hans Nielsen, Antonius Otto, and Brenton Watkins. David Newman enjoyed a one-year sabbatical, which, in principle, allowed him to complete numerous outstanding research projects. Lastly, Assistant Prof. Scott Bailey, who arrived in January 2002 has, with regret, left us and returned to his alma mater, Virginia Tech, where he is now an assistant professor in the Department of Electrical and Computer Engineering. The search for a replacement has begun.

As always, I look forward to constructive suggestions for improvements and

encourage notes telling us what you are doing. We will be delighted to share them in next year's newsletter.

## Student Graduations



We are delighted here, and in many cases belatedly so, to announce to our readers those students who have completed their undergraduate and graduate degrees in the past three years. We hope that each graduate carries away good memories of their time with us and UAF, and will remain in contact.

### Undergraduate Degrees (student, degree, major)

#### 2003-2004

Anthony R. Shaw, BS, General Science  
Everett C. Travis, BS, Physics  
Eric J. Olson, BS, Physics  
Jeremey A. Dunning, BS, Physics  
Andrew L. Frick, BS, General Science  
Jedediah A. Kallen-Brown, BS, Physics  
Justin N. Carstens, BS, Physics

#### 2004-2005

Noah B., George, BS, Physics  
Joseph P., Vanhoomissen, BS, General Science  
Jeffrey M., Mann, BS, Physics  
Timothy E. Stern, BS-Applied Physics  
Brian C. Hall, BS, Physics  
Harry B. Telling, BS, Physics  
Alice R. Kangas, BS, General Science

#### 2005-2006

Paul, D. Gradney, BS, Physics  
Richard, J. Stevens, BS, Physics  
Dennis Jackson, BS, Physics  
Rachael Shoulder, BS, Physics  
John Bittle, BA, Physics

**Graduate Degrees** (student, thesis or dissertation title, degree, advisor)

**MS, 2003-2004**

Jeffrey M. Holmes, *Morphology of Evening Sector Aurorae in 557.7-nm Doppler Temperatures*. (Space Physics, M. Conde)

Jon Klaas, *Synchronization in Biological Systems*. (Physics, R. Wackerbauer)

Safia Rawoot, *Six Degrees of Separation*. (Computational Physics, R. Wackerbauer)

John M. Styers, *Computational Physics - Parallel Physics*. (Computational Physics, A. Otto)

**MS, 2004-2005**

Michael Z. Abrams, *Development of a Video Analysis System for Auroral Infrasound*. (Computational Physics, J. Olson)

Erik D. Peterson, *A Study of Pulsating Aurora Through the Cataloging of Infrasonic and All-Sky Databases*. (Computational Physics, J. Olson)

Justin Yonker, *Spectroscopy of the  $N_2$  Vegard-Kaplan Bands in the Dayglow*. (Space Physics, S. Bailey)

Carl S. Andersen, *Characteristic Behavior of the Dayside Aurora in the Minutes Leading up to Substorm Onset: Evidence for External Triggering of Substorms by the Interplanetary Magnetic Field*. (Physics, C. Deehr)

**PhD, 2003-2004**

Karen J. Remick, *The Source of Ionospheric  $O^+$  in the Magnetosphere*. (Space Physics, R. Smith)

Ryan Woodard, *Building Blocks of Self-Organized Criticality*. (Physics, D. Newman)

**PhD, 2004-2005**

North Larsen, *Cloud Detection and Trace Gas Retrieval from the Next*

*Generation Satellite Remote Sensing Instruments*. (Atmospheric Science, K. Stamnes)

**PhD, 2005-2006**

Fred Hall, *A Mechanism for Current Sheet Thinning in the Growth Phase of Magnetospheric Substorms*. (Space Physics, A. Otto)

Matthew P. Krynicki, *A Search for Thermospheric Composition Perturbations due to Vertical Winds*. (Physics, M. Conde)

**Student Awards**

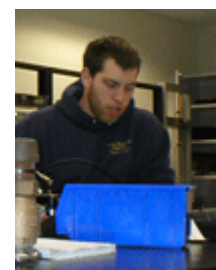
**Outstanding Undergraduate**



Ms. Rachael Shoulder was selected as the Physics Department's outstanding undergraduate student for the 2005-2006 academic year. Rachael graduated with a BS in Physics last spring and is currently attending a Peace Corps preparation class before leaving for work in Tanzania, Africa. Rachael received a Physics Scholarship for the 2005-2006 academic year. You can read more about her in last year's Physics Newsletter, which is available online at <http://www.uaf.edu/physics/Aboutus/Newsletters.htm>.

**Outstanding TA**

Mr. Noah George was selected as the department's outstanding Teaching Assistant for the 2005-2006 academic year. This recognition is given to the TA whom faculty, students and Robert Parsons believe has provided superior



instruction and service to the department and to the students in lower-division labs. In Noah's own words: "I have always been interested in science and mathematics. During high school I began reading science and technology magazines and became especially interested in physics. I decided to go to college at the University of Alaska Fairbanks and enrolled as physics major. During my undergraduate studies I found myself becoming more and more enamored by the field of physics. It was great learning how exact and consistent our physical world actually is, and then being able to quantify it into mathematical relationships. I particularly enjoyed studying Newtonian mechanics and solid-state physics. After graduating in December of 2004 I got a job teaching undergraduate labs in the physics department at UAF. I enjoy teaching very much, and may consider doing it professionally in the future. My future plans revolve around moving to the Middle East and getting my Master's degree (either here or in the Middle East). I hope to be able to use my knowledge of physics to get a job in the field of science/engineering, or possibly teaching."

### C. T. Elvey Memorial Scholarships

These scholarships are awarded annually to science students at the University of Alaska Fairbanks. The fund is named for Christian T. Elvey, who was director of the Geophysical Institute from 1952 to 1963, vice president for research from 1961 to 1963 and special assistant to the president from 1963 until he retired in 1967. Each award is for \$750.

The undergraduate student award went to Mr. Aemon Wetmore, who says: "I plan on graduating in the fall of 2007 with a Bachelor's in General Sciences with an emphasis in Physics and with minors in

Math and Japanese. I just completed a year as an exchange student in Sapporo, Japan studying the Japanese language and culture. After graduation I may pursue a Masters in Education but right now I'm just trying to graduate."



The graduate student award went to Mr. Samuel Lazerson. Sam received his BS degree in Engineering Physics from Embry Riddle in Florida, where he worked under Dr. Abas

Sivjee (also a UAF Emeritus Professor). One of Sam's hobbies is flying airplanes. For his graduate research, he is working with Dr. Wiechen on numerical simulations of dusty plasmas. He spent his first summer of research at the Max Planck Institute for Extraterrestrial Physics in Garching, Germany.

### Gray S. and Lola C. Tilly Scholarship

Lola Tilly established this fund in memory of her husband Gray, a Fairbanks businessman. Lola Tilly was a professor and head of the home economics department at the university from 1929 to 1937, then again from 1942 to 1963. She died in 1996. It is open to UAF students at the upper division or in a graduate program. Each 2006 award was for \$2500, and one of those was given to physics major Suntrana (Tran) Smyth.



"I'm just another one of those 'bush physicists.' I was raised in rural Alaska on a small subsistence farm. I grew up hunting,

fishing, berry picking, and hauling 5-gallon water buckets for potatoes, people, dogs and horses. After graduation with degrees in math and physics I hope to pursue a physics-related doctorate at Cal Tech. My dreams are to develop more efficient and powerful energy and propulsion systems, and to build and fly in the spacecraft of the coming era.”

### **Physics Department Scholarships**

The Physics Department at UAF solicits donations from faculty, staff, alumni, and friends to support this endowed scholarship fund. The intent is to benefit academically excellent and promising undergraduate physics students and to encourage high school students with strong interests in science to consider physics as a career. Awardees must be declared physics or applied physics majors at award receipt. A committee of contributors to the fund makes unsolicited awards.

Christopher Granade, William Weiss, and Lisa Stowell were awarded scholarships from the endowed Physics Scholarship Fund in the amounts of \$300, \$100, and \$100. Chris is an upper-division student. Motivation for the two smaller awards was to acknowledge several students of promise early in their degree programs. We later learned that Lisa has transferred to the College of Engineering and Mines.

Chris Granade. “I am seeking a triple degree in physics, mathematics and computer science with the hopes of pursuing a graduate program in quantum computing and information theory. Currently, I am engaged in research with Dr. John Olson into the modeling of infrasound microphones using MATLAB. I hope to find a summer research



program in quantum computing, and to otherwise pursue my academic career that I have started to develop in the physics department.”

### **Update on Physics Scholarship awardees:**

Ms. Rachael Shoulder.  
Graduated this spring. See above.

Mr. Aemon Wetmore.  
Spent the 2005-2006 academic year studying in Japan. He has now returned to UAF for his final year of undergraduate studies.

### **Society of Physics Students**

The Society of Physics Students at UAF, a student club dedicated to the pursuit of learning physics, is looking forward to celebrating another semester of learning through seminars, demonstrations, projects and field trips. Under the direction of its president, Jason McDonald, SPS is currently preparing for the 2006-07 our seminars and other club activities.

One of the Society’s most important functions is to plan for and host exciting talks on various physics-related topics. In September, for instance, the SPS hosted a talk by Robin Blume-Kohout, entitled “What do you mean, my information is quantum?” (Note: Robin Blume-Kohout is a postdoc at CalTech working in the area of quantum computing. He is a Fairbanks Lathrop High School graduate.) In previous semesters, the SPS has hosted talks by our own local faculty, as well as those by guests, such as Travis Rector. The Society also has plans for several more exciting talks this semester. One of those planned is a seminar on how the mathematical rigor of physics

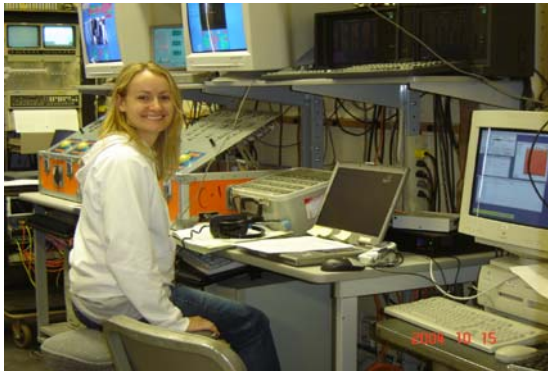
has influenced other sciences, especially biology. This exciting seminar is to be delivered by Dr. John Rhodes, of the UAF Mathematics Department.

SPS does more than just host talks, however. In previous years, SPS has engaged in field trips to exciting locations, such as HAARP and the Poker Flat Research Range. SPS also takes in active role in Science Potpourri each year, as well as other outreach efforts.

Those undergraduate students interested in participating in SPS activities should e-mail [spsuaf@gmail.com](mailto:spsuaf@gmail.com), or attend the first official meeting on Friday, October 6 for more information.

-Christopher Granade, SPS Secretary

## Student Research



Graduate student Erica Rogers received an Outstanding Student Paper Award for her paper at the 2006 meeting of the American Geophysical Union in Baltimore, Md. Co-authors were Scott Bailey, Harry Warren, Thomas Woods and Francis Eparvier, and the title was *Solar Flare Soft X-ray Irradiance and its Impact on the Earth's Upper Atmosphere*.

Abstract for the paper:

Solar soft X-rays are one of the principal energy sources that lead to the production of

thermospheric nitric oxide (NO) through the dissociation of molecular nitrogen. The density of NO peaks in the lower thermosphere near 106 km and responds linearly to the amount of solar soft X-ray energy deposited at that altitude. Solar flare soft X-ray irradiance provides a highly variable energy source to the lower thermosphere. Most of the solar flare soft X-ray irradiance comes from the 0.1-2 nm range and is deposited near 106 km where peak NO production occurs, thus the hottest flares can increase the NO production at this altitude. NO plays an important role in the energy balance of the thermosphere as it is a source of radiative cooling in the infrared.

Observations from three NASA satellite missions, the Thermosphere, Ionosphere, Mesosphere, Energetics and Dynamics (TIMED), the Solar Radiation and Climate Experiment (SORCE) and the Student Nitric Oxide Explorer (SNOE), are analyzed to determine how solar soft X-ray irradiance varies during a solar flare and how this irradiance affects the Earth's lower thermosphere.

## News and comments from alumni and friends

### Matt Krynicki, PhD 2006, Space Physics

"I grew up in the Detroit metropolitan area and I received my Bachelor of Science in May 1993 at Wayne State University in Detroit with a major in Physics and minors in Mathematics and English. What did I enjoy at graduate school? Well, that's pretty easy to say; I wanted to study physics beyond the undergraduate level because I like physics a lot, so I thoroughly enjoyed my course work. In addition, the opportunity to travel to remote, amazing



places to perform research was wonderful. Living in AK was great; I miss the long, cold, dark winters immensely. The one thing I didn't enjoy was 24-hours of daylight from late May to early July. The mild summers are nice, but too much light!"

**Wesley E. Brittin, Boulder CO**

(April 21, 1917-August 1, 2006) MS physics, Princeton U.; PhD physics UAF. Dr. Brittin taught at the University of Colorado Physics Department, which he chaired for 19 years before retiring in 1977.

**Faculty News**



**Brenton Watkins**  
([watkins@gi.alaska.edu](mailto:watkins@gi.alaska.edu))

“For the past few years my research has become more focused on use of the HAARP ionospheric modification facility at Gakona, Alaska. We have successfully operated a new UHF diagnostic radar in conjunction with high-power HF ionospheric modification experiments. The radar has enabled us to observe plasma waves in the ionosphere that are induced by the high-power HF pump wave. The HAARP facility is currently undergoing construction to complete an expansion of the HF transmitting array with correspondingly larger power; when completed in early 2007, HAARP will be the world’s largest and most capable ionospheric modification facility, and we look forward to a range of new science opportunities. Dr Shin-ichiro Oyama, a Research Associate with the Geophysical Institute, has been a helpful co-worker with me on this project. We are also completing construction of a new imaging riometer at the HAARP site. This will be used to search for particle precipitation events that are induced by VLF waves

generated by modulated HF waves from the HAARP transmitter. We also plan to use the imaging riometer at HAARP as an astronomical tool to detect scattering from HAARP-induced irregularities in the ionosphere. The method detects signals from strong radio-star sources that are scattered by ionospheric irregularities created by the high-power HF signals. This new idea has recently successfully been applied using the imaging riometer at Poker Flat, Alaska. Professor Yampolski from the Institute of Radio Astronomy, Ukraine National Academy of Science, works with us on the irregularities project, and Prof Alan Weatherwax from Siena College, NY is a co-investigator on the riometer project. A UAF Physics Department undergraduate student, Jason Turnquist, has helped with installing the riometer antennas at HAARP and he is also proficient at processing plasma wave data acquired with the UHF radar.

Nubuhiro Suzuki has just completed a PhD using incoherent-scatter radar data from the NSF facility at Sondrestrom, Greenland. He has processed a large database to determine ion mass values inside thin sporadic layers that occur in the ionosphere. These layers are mainly composed of metal ions of meteoric origin. We are also interested in the new incoherent-scatter radar that is being installed at Poker Flat, Alaska and I am looking for a new graduate student to work with me using that facility.

A graduate student now working with me, Chris Fallen, is developing a new theoretical ionospheric model that we expect to be used to study time-dependent chemical changes in the ionosphere. His work may then later be incorporated into a more comprehensive global model that would be run by my colleagues Anton Kulchitsky and Sergei Maurits in the Arctic Regions

Supercomputer Center (ARSC). The current high-latitude 3-D time-dependent ionospheric model that we run at ARSC has been used with a 3-D ray-tracing program to predict range and target errors for UHF radars operating at high latitudes. Our long-term goals are to improve the model for global coverage and to increase the number of ion species that are modeled.”

### **New Undergraduate Curriculum**

The physics curriculum approved by the faculty reduces the number of credit hours from 130 to 120 for the four-year BS degree programs in physics and applied physics, and the BA program, and has created a new sequence for the early courses. Increased use of computers and numerical methods has made imperative a new one-semester course, Introduction to Computational Physics. In the current curriculum, necessary mathematics was introduced as needed. In the new curriculum, Introduction to Mathematical Physics (one semester) is designed to provide, by the end of the sophomore year, all necessary introductions for the remainder of the undergraduate experience. This provides the means to reduce the two semesters each of Mechanics and of Electricity and Magnetism into a three-semester sequence, Classical Physics. The Physics Laboratory experience will be reduced to one semester, while Optics and Thermodynamics and Statistical Physics will remain as they are. The two-semester Modern Physics course becomes a one-semester course specifically focused on Quantum Mechanics, and Solid State Physics is rolled into “emphasis topics”, as is discussed below. The wholly new part of the curriculum appears within a rotating sequence of six one-credit courses over two semesters, which provide compressed, focused development of specific topics.

While just three credits are required in the emphasis topics and three in the applications topics for the BS degree, additional options from the varying lists can be taken for elective credit or as additional credits. The current lists for the one-credit courses are:

#### **Emphasis Topics**

Condensed Matter Physics I; Condensed Matter Physics II; Space and Auroral Physics; Nonlinear Dynamics; Biophysics; Nuclear and Particle Physics; General Relativity; Astrophysics; Topics in Modern Mathematical Physics

#### **Application Topics**

Planetary Atmospheres; Fluid Dynamics; Plasma Physics; Hamiltonian Mechanics; Physics of Glaciers; Remote Sensing; Solar Physics; Advanced Laboratory; Spectroscopy; Cosmology; Quantum Computation; Covariant Kinematics and Dynamics.

Selection of these courses for each year will be made based on student interest and faculty availability. We will keep you informed as to our progress.

### **Staff News**

Robert Parsons, Laboratory Supervisor and Department Safety Officer [ffrap2@uaf.edu](mailto:ffrap2@uaf.edu)



“I am the laboratory supervisor for the Physics Department. My primary duties involve keeping the labs running smoothly for the hundreds of students taking physics courses every semester. This involves assigning TAs to specific labs, and teaching the TAs how to do the labs so the students can get the most out of the experience. I feel the physics labs should be fun; work, but fun. I also believe just playing with the physics laboratory

equipment with your own hands and then seeing the numbers support (or not) a physical law is so cool.

I order lots of equipment so everybody has a chance to “play” during lab. This ordering and updating goes on all year long. Writing up new labs and updating old ones is also an ongoing aspect of my job. I get help from the TAs who actually have to teach the labs and from the students who beta-test them. They always offer timely suggestions on improvements. I am thankful for their help.

I also fix and order and make demos for classroom and outreach activities, and I am responsible for the upkeep and maintenance of all computers and printers in the labs. This can sometimes try one’s patience, which I do. A really fun part of my job is public outreach. This involves working with Science Potpourri, E-week, First Robotics (both Lego and the Big Iron), TASK, ASRA, Science Symposium and classroom demonstrations for the school district.

At home I like to hunt, fish, hike, ride go-carts, motorcycles and bicycles, running with the family and especially building things. On long winter’s eves a hot computer game can be lots of fun too.”

## Adjunct News

The Physics Department is always in need of assistance in fulfilling its teaching obligations, and we currently are ably assisted by John Petersen (see last year’s newsletter) and David Withoff.

David’s comments:

“Teaching a few classes a year as adjunct member of the Physics Department has turned out to be a great way for me to get back into academic physics after fifteen years of doing applied mathematics and

working with commercial software in the business world.

When I finished my Ph.D. in physics at the University of Illinois, I wasn’t sure if I really wanted to continue doing academic



research, but I never lost my enthusiasm for physics or my interest in teaching. Even though I have been away from academia for a while, I have never been far

from teaching. I enjoyed my teaching responsibilities when I was a graduate student, and after graduation I spent many years designing and presenting training courses for non-academic audiences.

Teaching presents an interesting challenge that nicely complements the challenge of solving physics problems. Figuring out the solutions to physics problems exercises one part of the brain, and figuring out how to explain the solution to someone else exercises an entirely different part of the brain, so for me, teaching physics is a nearly perfect occupation.

So far I have been teaching general physics classes (Physics 103, 104, 211, and 212). Next semester I am looking forward to the opportunity to call on my background with mathematical software in teaching Computational Physics (Physics 220).”

*(Note: The large object at David’s left in the photograph is a creation from another part of his brain. jdc).*

## Faculty Synopsis

### The Teaching Faculty, 2005-2006

**Scott Bailey** (Univ. of Colorado) Assist. Prof. of Physics. Aeronomy and solar terrestrial physics. Upper-division course Optics.

**Ataur Chowdhury** (Clark Univ., Massachusetts) Assoc. Prof. of Physics. Condensed matter physics, nano-technology. Upper-division courses Electricity and Magnetism (2 semesters), Introduction to Solid State Physics, and Introduction to Thermodynamics and Statistical Physics.

**John Craven** (Univ. of Iowa) Chair and Prof. of Physics. Thermospheric composition, magnetospheric and auroral physics, rocket and spacecraft instrumentation. Upper-division course Mechanics (2 semesters).

**David Newman** (Univ. of Wisconsin) Prof. of Physics. Complex systems, turbulence, nonlinear dynamics, fusion plasma physics. On sabbatical.

**Hans Nielsen** (Royal Technical Univ. of Denmark) Prof. of Geophysics. Rocket investigations, high-speed imaging of the aurora. Lower-division course Introduction to Astronomy.

**John Olson** (Univ. of California Los Angeles) Prof. of Physics. Plasma-wave propagation, atmospheric infrasound, digital signal processing, magnetospheric physics. Graduate course Fundamentals of Geophysical Fluids and lower-division Introduction to Computational Physics.

**Antonius Otto** (Ruhr-Universitaet Bochum) Prof. of Physics. Space plasma theory and simulations. Graduate course Magnetospheric Physics.

**Channon Price** (Univ. of California Santa Barbara) Assoc. Prof. of Physics. Astrophysics, space plasma physics, and nonlinear dynamics. Two graduate courses, Classical Mechanics and Statistical

Mechanics, and the lower-division course College Physics (2 semesters).

**Davis Sentman** (Univ. of Iowa) Prof. of Physics. Space plasma physics, artificial heating of the ionosphere, atmospheric electricity. The graduate courses Space Physics and Digital Time Series Analysis.

**Curt Szuberla** (Univ. of Alaska Fairbanks) Assist. Prof. of Physics. Atmospheric infrasound and digital signal processing. Upper-division course Physics Laboratory (2 semesters).

**Martin Truffer** (Univ. of Alaska Fairbanks) Assist. Prof. of Physics. Glacier dynamics, application of geophysical and borehole techniques to glaciology and numerical modeling of ice flow. The undergraduate course Energy and Society.

**Renate Wackerbauer** (Max-Planck Institute for Extraterrestrial Physics) Assist. Prof. of Physics. Complex systems, nonlinear dynamics and chaos, modeling of biological systems. Upper-division course Modern Physics (2 semesters) and the lower-division course University Physics (2 semesters).

**Brenton Watkins** (Univ. of Alaska Fairbanks) Prof. of Physics. Radar studies of the atmosphere and ionosphere. Lower-division course Elementary Modern Physics.

**Heinz Wiechen** (Ruhr-Universitaet Bochum) Assoc. Prof. of Physics. Space plasma theory and simulation, dusty plasmas, astrophysics. The graduate course Fundamentals of Plasma Physics.

### Emeritus Faculty still drawn to the classroom

**Charles Deehr** (Univ. of Alaska Fairbanks) Emeritus Prof. of Physics. Spectrophotometric studies of atmospheric emissions. Teaches Auroral Physics in the odd-year spring semesters.

**John Morack** (Oregon State Univ.) Emeritus Prof. of Physics. Subsea

permafrost, ice physics, distance education. Continues to teach an introductory physics course by distant delivery each spring, with a one-week student residency at UAF at the end of the course to do all the lab experiments.

### **Adjunct Instructors, 2005-2006**

John K. Petersen (MS, Univ. of Alaska Fairbanks) College Physics (2 semesters)  
David Withoff (PhD., Univ. of Illinois) University Physics (2 semesters)

### **Faculty now doing other things at UAF**

Syun-Ichi Akasofu, Director, International Arctic Research Center  
Roger Smith, Director, Geophysics Institute, UAF

### **Former Faculty Members**

Albert Belon, Ester, AK  
Alfred Bork  
Neal Brown, Director, UAF Space Grant  
Neil Davis (emeritus), Fairbanks, AK  
Vladimir Degen, Fairbanks, AK  
Thomas Hallinan (emeritus), research at the GI  
William Harrison (emeritus), research at the GI  
Joseph Kan (emeritus), research at the GI  
Lou-Chuang Lee, National Space Program Office, Taiwan  
John Murry  
Takeshi Ohtake  
R. Parthasarathy  
George Reed, Aeronomy Laboratory, NOAA, Boulder, CO  
Manfred Rees (emeritus), Gloucester, Australia  
Juan Roederer (emeritus), active at the GI and around the world  
Gerry Romick, Eugene, OR  
Glenn Shaw (emeritus), research at the GI  
Roger Sheridan (emeritus), Langley, WA  
Knut Stamnes (emeritus), Stephens Institute of Technology, Hoboken, NJ

Abas Sivjee (emeritus), Embry-Riddle Aeronautical University, FL

Daniel Swift (emeritus), research at the GI  
Gerd Wendler (emeritus), research at the GI  
Charles Wilson (emeritus), research at the GI

We would appreciate knowing of omissions and factual errors.

### **Physics Scholarship Fund**

The Physics Department at UAF created this scholarship fund for the purpose of acknowledging academically excellent and promising undergraduate physics students and to encourage high school students with strong interests in science to consider physics as a career. Awardees must be declared physics or applied physics majors at award receipt. A committee of contributors to the fund makes unsolicited awards.

Once again, I wish to give special recognition to the contributing members, who have joined with us in this effort to create something new and forward looking for the Physics Department, and something that will live on after us, contributing to the future of UAF, this our college, and this our department. We are indebted to all of you, founding, continuing, and new supporters for your generosity. (Founding members are noted by \*)

\*Syun Akasofu, Fairbanks AK  
\*Warren Akers, Eugen AR  
\*Robert Benson, Silver Spring MD  
\*Susan Broadston, Santa Cruz CA  
Oakley Cochran, Anchorage, AK  
\*John and Anthea Craven, Fairbanks AK  
\*William Dambeck, New Creek WV  
\*John Dawson, Bala Cynwyd PA  
\*Barbara Day and Jim Dixon, Fairbanks AK  
\*Neil Davis, Fairbanks AK

\*Will Harrison, Fairbanks, AK  
\*John Hughes, Daytona Beach, FL  
\*Nettie LaBelle-Hamer, Fairbanks AK  
\*Harold Leinbach, Boulder CO  
Edward Lilley, Harwich Port, MA  
\*Yu Lin, Auburn AL  
\*Craig Lingle, Fairbanks, AK  
\*Matthew McHarg, Colorado Springs, CO  
Mark Moldwin and Patty Hogan, Los Angeles, CA  
\*David Newman and Uma Bhatt, Fairbanks, AK  
Mary and Robert Parsons, Fairbanks, AK  
\*Paul Perreault, Boulder CO  
Laura Peticolas, Berkeley, CA  
Mark Piedra, Portland OR

\*Lee Snyder, Orrington ME  
Roger Sheriden, Langley, WA  
\*Roger Smith, Fairbanks, AK  
Ernest Stiltner, Jamestown, CO  
\*Guy Urban, Anchorage AK  
\*Renate Wackerbauer, Fairbanks, AK  
\*John Williams, Iowa City  
\*Stephen and Veronica Young, Rancho Palos Verdes CA

Please let me know if you had intended your gift to also be in the name of your spouse or partner.

Physics Department  
University of Alaska Fairbanks  
PO Box 755920  
Fairbanks AK 99775-5920

**ADDRESS CORRECTION REQUESTED**



## Contribution Form

The UAF Physics Scholarship Fund recognizes excellence in academic achievement for UAF students majoring in physics. Special awards may also be offered to winners of the Alaska State High School Science Symposium. Contributions for other needs are gratefully appreciated.

UAF Physics Scholarship Fund  
College of Natural Science and Mathematics  
My gift is for \$ \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City, State \_\_\_\_\_

Phone \_\_\_\_\_

Email \_\_\_\_\_

Joint recognition for this gift should include: \_\_\_\_\_ (name)

Pay by Check: \_\_\_\_\_ Check attached (payable to the UAF Physics Scholarship Fund)

By Credit Card: \_\_\_\_\_ Please charge my credit card \_\_\_\_\_ VISA \_\_\_\_\_ MasterCard

Card # \_\_\_\_\_ Expiration date \_\_\_\_\_

Signature \_\_\_\_\_ Name as it appears on the card \_\_\_\_\_

In Installments: \_\_\_\_ I pledge \$ \_\_\_\_\_ to be paid in \_\_\_\_ installments beginning \_\_\_\_\_  
please remind me

Electronic Funds Transfer: \_\_\_\_\_ (See the next page: no more check writing or credit card issues)

Payroll deduction: \_\_\_\_\_ If you are UAF staff or faculty member you can fill out and attach a payroll deduction authorization form (at "Other Employee Selected Donations") available at <http://www.alaska.edu/giving/staffcontribution.pdf>

Mail to: **Advancement Services**

University of Alaska Fairbanks  
PO Box 757530  
Fairbanks, AK 99775

OR give online at [www.uaf.edu/giving](http://www.uaf.edu/giving)



University of Alaska Foundation  
ACH Debit Authorization Form

UAF Physics Scholarship Fund

I authorize the University of Alaska Foundation to deduct from my bank account a gift of \$\_\_\_\_\_ per month (\$25 minimum) on the (check one) \_\_\_1<sup>st</sup> or \_\_\_15<sup>th</sup> of each month for a total gift of \$\_\_\_\_\_(optional). I have enclosed a voided check that contains my bank information.

Name\_\_\_\_\_

Address\_\_\_\_\_

City, State, Zip\_\_\_\_\_

\*\*IMPORTANT\_\_\_\_\_

Signature	Date
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Please note that there could be a delay of up to one full month before the first transaction is processed due to pre-notification requirements to your bank.

**Please complete and mail with a voided check to:**

**Advancement Services**  
University of Alaska Fairbanks  
PO Box 757530  
Fairbanks, AK 99775