2005 was a busy and productive year for the NYSS. Our Spring Symposium, chaired by George Thurston, was held April 15-16 at the Rochester Institute of Technology on the topic “Frontiers in Squishy Physics: Phase Transitions and Dynamics in Complex Fluids, Biological Fluids, and Granular Materials” — meaning materials having unusual flow characteristics, such as gravel, straws in sand, and macromolecules. Some of the demonstrations gave results that were startlingly nonintuitive. Our Fall Symposium, chaired by Kiko Galvez at Colgate University, was titled “Albert Einstein and His Legacy.” Kiko organized an outstanding set of speakers. Perhaps the most interesting to me, being an applied physicist, was Neil Ashby’s talk on the importance of including general relativity in the design of the Global Positioning System. The Symposium was very well attended, especially by students — we spent $3000 on student travel so that students from other NY colleges and universities could attend. Kiko handled the complications of a simultaneous football weekend and continuous rain masterfully.

Our Spring Symposium. April 7-8, 2006, “Physics and Technology of Microsystems,” chaired by Dave Trauernicht of Kodak, will address device physics from nanotechnology to MEMS, including a design software demo and a lab tour. It is sponsored by the Infotonics Technology Center in Canandaigua, NY, and will be held at Finger Lakes Community College, also in Canandaigua, thanks to Sam Samanta, Chairman of Science and Technology at FLCC. Our Fall 2006 Symposium will be held Oct. 20-21 at SUNY Potsdam, chaired by Larry Brehm, on the topic of acoustics — physical and musical. Having the cooperation of the Crane School of Music (Rene Fleming’s alma mater) will make this symposium especially interesting.

We continue to support and encourage students (high school through grad school) by providing travel support to our symposia, speakers, and outreach grants supporting research projects and teaching initiatives. The latest research proposal to be accepted is to use flights in a hot-air balloon to make cosmic ray muon measurements. I’d like to participate in that one!

Last spring’s biannual Executive Committee election gave us several new members. We are pleased to have more women on the Committee than before, but now we are down to only two industrial members, and no one from the government laboratories. Boosting those numbers will be a priority in next spring’s elections. Anyone interested should contact Bob Pompi, our Vice-Chair, at rpompi@binghamton.edu.

Membership remains strong. We now have 2067 members, just behind New England (2126) and Southeastern (2238). As one of the three largest Units, we are one of the Units in rotation having a vote in the APS Council. Remember that you can become a member of the NYSS free, whether you live in NYS or not, merely by checking the box on your membership renewal form or online at any time, for free.

Stacie Nunes (SUNY New Paltz) and I spent two days in October at SUNY Buffalo State College carrying out a review and evaluation of the Physics Department at the request of the
The Spring 2005 NYS Section APS Symposium was hosted by the Rochester Institute of Technology on April 15 and 16. The topic was *Frontiers in Squishy Physics: Phase Transitions and Dynamics in Complex Fluids, Biological Fluids and Granular Materials*. The Symposium was hosted by the Physics Department, and organized by Professors George Thurston (chair), Michael Kotlarchyk and Scott Franklin.

Basically, the meeting featured 14 plenary talks, of a tutorial or topical nature, presented by active researchers and experts who work in various areas of soft condensed matter physics. In addition to speakers from New York State (Cornell, U of Buffalo, Yeshiva University, Clark University and Brookhaven Laboratory), half of the talks were delivered by scientists from other institutions in the northeast (NIST, Yale University, U Mass-Amherst, MIT and Penn State). The topics and talks were aimed to be accessible to students and other attendees unfamiliar with the field.

A pre-banquet poster session was held on Friday evening. Three RIT students won awards for their posters: Kenneth Desmond (physics undergraduate) was awarded a $75 prize for his poster entitled Connected Networks, Jammed States and Force Fluctuations. Elvis Zambrano (materials science and engineering graduate student) and Mufadal Ayubali (chemistry graduate student) were each awarded a $50 prize for their posters related to self-assembled structures (micelles and microemulsions) in fluids. Professor Anthony Dinsmore of U Mass-Amherst delivered the after-dinner talk on Colloids as a Tool for Studying Phase Transitions.

–Mike Kotlarchyk

The New York State Section had its own Einstein celebration. The topic of our Fall 2005 symposium was *Albert Einstein and His Legacy*. The symposium took place at Colgate University on October 14 and 15. Colgate University is a small liberal-arts college in a picturesque village of Up-state New York. The symposium featured eleven speakers, who talked about Albert Einstein and his scientific legacies.

The symposium’s three sessions were split among the topics of Einstein’s 1905 major works: the photon, relativity and statistics. Arthur Zajonc (Amherst College) opened the conference with discussion of light and the meaning of the photon. He was followed by Stephan Friedrich (LLBL), who contrasted the previous talk with a discussion of modern ways to detect photons. Then the topic turned into quantum mechanics and light. Bob Boyd (U. Rochester) talked about quantum imaging and Bill Wootters (Williams College) followed with a discussion of uses of the quantization of light, entanglement, and quantum teleportation.

The day concluded with a public lecture by John Stachel (Boston U.), whose talk was titled “The Man Behind the Myths.” Stachel, founding editor of “The Collected Papers of Albert Einstein,” emphasized that Einstein did his discoveries at a young age, and so we should remember...
him by his picture as the young patent-office clerk. Stachel also pointed out the many myths about Einstein, true and false, and his activism as a pacifist.

The next day started with the session on relativity. Neil Ashby (U. Colorado) opened with an illuminating talk about practical uses of general relativity in global positioning systems. He was followed by Rachel Bean (Cornell U.) who gave a talk about relativity and the current mysteries in astrophysics. After a coffee break the session turned to the detection of gravitational waves. Peter Saulson (Syracuse U.) talked about LIGO and Earth-based gravitational-wave detectors, and Shane Larson (Penn State) followed talking about LISA, the forthcoming mission to deploy a gravitational-wave detector in space.

The conference concluded with two talks about statistics and Brownian motion. Nick Bigelow (U. Rochester) talked about Bose-Einstein condensation, and Dean Astumian (U. Maine) talked about molecular motors. In all the attendees were treated to an illuminating set of lectures. Indeed an Einstein celebration!

I wish to thank the members of the local committee, Joe Amato, Tom Balonek and Ken Segall, and an outstanding person behind the scenes: Diane Janney. Finally, I want to thank members of the Colgate Physics Club, who made posters about Einstein and helped with the symposium logistics.

—Kiko Galvez

Student Poster Awards: 1st Place: Charles Anderson (Adelphi University); 2nd Place: Amber Beckley (Binghamton University), Christina Fennimore (Binghamton University); 3rd Place: Lindsey Goodman (Binghamton University), Bradford Melius (Colgate University).
Historical Notes

The past symposium held at Colgate University was of historical significance to our section. 2005 saw the World Year of Physics in celebration of the 100th anniversary of Einstein’s papers. In celebration of that historic event, the topic for the NYSSAPS fall 2005 meeting was “Albert Einstein and His Legacy”. As the 93rd topical symposia, this was the first time that the topic centered on an individual physicist and the legacy he left. However, this was not the 1st time the state section has deviated from its prescribed format.

Meetings for the NYSSAPS officially began in the spring of 1938. It wasn’t until the fall meeting of 1959 that the 1st topical symposium was held. The meeting was held at the University of Rochester with the topic “Modern Advances in the Useful Conversion of Energy”. The meeting opened with 2 papers presented on Fuel Cells. The 1st paper was titled “A Description of Fuel Cells-Historical, Operation and Applications”, and the 2nd paper was titled “A Description of Fuel Cell Reactions”. These were then followed by a general discussion of the papers. The speaker for the banquet that night was Dr. J.W. Howland who gave a talk on “Nuclear Power and the Attendant Human Problems”. Dinner that night was $2.50 per person plus an additional $1.75 for cocktails. Dinner for the Fall 2005 meeting was $25.00 and a glass of wine was $5.00.

Despite the increase in food costs, the overall format and topics presented have not changed very much over the years. As a matter of interest though, a note on the program for the spring, 1959 meeting held at RPI states that “The Troy-Albany area abounds with places to see and things to do that will be of interest to the wives and children of members. Wives are especially invited to the Social Hour and Banquet on Friday.”

—Jill Linz, Section Archivist

Science Olympiad

You probably know about our state section Outreach program. Another way to get younger students involved in physics, and in science in general is through Science Olympiad. <http://www.soinc.org/>

On March 4, March, science and math faculty at SUNY Potsdam will be participating as judges in a Science Olympiad for middle schools students. In an Olympiad, student teams from area schools must build a device or solve a problem following a set of directions put forth by the national office. The directions might include specifications that are clever and unforgiving, and maybe even tedious, for building a structure or meeting some sort of technical challenge.

I will be the “judge” for the groups doing the bridge-building contest, which means I get to furnish the equipment with which the group must destroy their own creation. The one able to take the most abuse, i.e., hold up the biggest load, wins.

Assisting in a Science Olympiad event in your area can be a great way to help to keep students interested in science, have some fun yourselves, meet science teachers, and maybe even destroy something in the process.

—Larry Brehm

From the Chair, continued from page 1

Department Head, Mike DeMarco, and the Dean of Natural and Social Sciences. Two days of visits, followed by three weeks of writing and revision. It was a valuable experience for us and, we trust, a helpful one for the Department. Anyone else whose Department is due for evaluation should keep the NYSS in mind as a possible source of knowledgeable reviewers.

Finally, the annual Convocation of APS Unit leaders will be held in College Park at APS headquarters on February 18, and we are sending representatives as usual. Even more important is the previous day, when available Unit representatives spend a day on Capitol Hill lobbying their Senators and Representatives to encourage them to support scientific research, and in particular physics, in the upcoming budget deliberations. This is not an easy thing to do in the Washington of today, but last year we were well received and we hope have had some impact. All NYSS members could help by communicating with their Washington representatives about specific programs they feel are important.

We look forward to seeing you at our next Symposium.

—James C. Owens, Chair, NYSS
jcowens@post.harvard.edu

Why should you join the New York State Section?

• We sponsor symposia about interesting topics in physics and related fields. We encourage students to attend the meetings and subsidize their expenses. We give cash awards to the best student posters at the meeting.
• We make a special effort to bring together academic and industrial physicists of New York State.
• Twice a year we give outreach grants. Success rate is 80%.
• We represent New York State in the APS Council.

How do you become a member?

• It is easy and it costs you no money. Just put a checkmark on New York State Section box when you renew your APS membership.

Do you want to get involved?

• Host a symposium. Contact our Chair Jim Owens (see last page for contact information).
• Become a member of the Executive Committee: Next spring we will hold elections for six positions. Contact our Vice-Chair Bob Pompi. Ballot goes out at the end of the year.

—Bob Pompi. Ballot goes out at the end of the year.
Recent NYSS Outreach Awards

2005 - Fall Award
Jennifer Seger, a graduate student in the Department of Physics and Astronomy at the University of Rochester, Rochester, N.Y. was awarded $1,000 for a project entitled “Relativistic Motion of Cosmic Ray Muons.” The grant provides air time in a balloon so that experiments in particle physics designed by area high school students can be performed at different altitudes. Jennifer and her collaborating high school teacher, Brianna Wood, participate in the Rochester area PARTICLE program.

2005 - Spring Awards
In the spring two awards were made with joint funding from the NYSSAPS and the New York State Section of the American Association of Physics Teachers:

Michael W. Noel, a faculty member at Bryn Mawr College, Bryn Mawr, Pa. was awarded $2,200 for a project entitled “Ball of Physics.” The grant provides the supplies needed to construct a series of hands-on demonstrations that will be performed by undergraduate physics students at Bryn Mawr in local elementary schools.

Renee D. Diehl, a faculty member at Penn State University, University Park, Pa., was awarded $2,192 to support an interdisciplinary project entitled “Inquiry-based Sound and Light Course for Pre-service Teachers.” The grant provides equipment to support instruction in this lab-based course.

Two awards were made with funding entirely from the NYSSAPS:

Andrea Markelz, a faculty member at the University of Buffalo, Buffalo, N.Y. was awarded $2,000 for a project entitled “Physics Awareness and Exploration.” The grant provides supplies and equipment to construct self-guided exhibits explaining physical principles for visitors to the UB campus.

David W. Kraft, a faculty member at the University of Bridgeport, Bridgeport, Ct. was awarded $2,000 to support a project entitled “EinsteinFest 2005.” The grant provided conference support for this one day symposium held at the Rockefeller University and focused on the legacy of Einstein’s work in celebration of the centenary if the publication of his five seminal papers.

Congratulations to New York State Winners of APS Prizes and Awards

Angel Garcia, Rensselaer Polytechnic Institute, Edward A. Bouchet Award. “For his contributions to the understanding of the role of water in the dynamics and folding of proteins through computer simulations.”

Peter van Nieuwenhuizen, SUNY at Stony Brook, Dannie Heineman Prize. “For constructing supergravity, the first supersymmetric extension of Einstein’s theory of general relativity, and for their central role in its subsequent development.”

Charles B. Duke, Xerox Innovation Group, George E. Pake Prize. “For groundbreaking theoretical contributions to the understanding of tunneling in solids, and inelastic scattering of low-energy electrons in solids, and for his outstanding contributions to Xerox Corporate Research both as an intellectual leader and research manager.”

Yuri Orlov, Cornell University, Andrei Sakharov Prize. “For his distinction as a creative physicist and as a life-long, ardent leader in the defense and development of international human rights, justice and the freedom of expression for scientists.”

Paul G. Richards, Columbia University, 2006 Leo Szilard Lectureship Award Recipient. “For work applying his expertise in geophysics to seismic detection of nuclear explosions. His developments in ‘forensic seismology’ are at the heart of the verification required for a test ban.”

NYSS sponsored activity:
University of Rochester group in collaboration with local high-school students loading a muon detector for measurements at different altitudes.

—Stacie Nunes
Reporting from The American Physical Society Council

The APS Council is a body that sets the policy of the Society. It is comprised of officers of the American Physical Society (such as the President, the vice-President, the past-President, the President-Elect, and the Operating Officers), the Chairperson of the Nominating Committee and the one of the Panel on Public Affairs, and of representatives of Divisions, Forums, and State Sections. There are also individual members elected to the Council and non-voting representatives of the Canadian and Mexican sister Societies. In total there are forty voting members plus several non-voting members of the APS staff. A subset of this body forms the Executive Council.

The tasks of the Council are numerous (see http://www.aps.org/exec/const/) and include: review the actions of the Executive Board and of the Operating Officers, approve the annual budget, set membership dues, authorize and review public policy statements by the Society, authorize studies sponsored by the Society, elect Fellows, authorize the establishment of new units of the Society, establish new prizes and awards, and propose amendments to the Constitution and approve amendments to the Bylaws. (The recent changes in the Bylaws of our Section had to be approved by the APS Council).

APS Units (Divisions, Forums, and Sections) that have passed a certain threshold of membership (as percentage of the total membership) are represented at the Council with voting privileges. However, State Sections that are above the threshold have two representatives at any given time, serving a staggered 4-year term. The Sections represented are on a rotating schedule. Currently, the members from the Ohio State Section and the New York State Section have one representative each. I am the one from the NYSS and this calendar year, 2006, will be my final year in my 4-year tenure. In addition, our Bylaws allow the nomination of a New York State Section observer (with no voting power); we might consider sending an observer to Council meetings in the coming years when we will not have a voting representative at Council.

What does the Council do in practice? Last year, the Ohio councillor and myself circulated a report on what the Council did in the April Council Meeting in Tampa, Fl. It was attached to the minutes of the NYSS Spring Symposium and soon you will be able to read it on-line on our site. A similar document will be circulated shortly reporting on the activities of the Council during the November Meeting in Chicago. To give you an idea of what happens at Council meetings, here are the main points of the Meeting that might of interest to members of our Section.

Governance

APS membership continues to grow and is now at an all time high of over 44,000 members. The New York State Section, after a few years of slight decline has registered an increase in membership, reaching almost the 2000 member mark. If you are not a member of our State Section, please consider joining (for free) by checking the appropriate box in your APS membership renewal form, or by going to the APS website at any time: http://www.aps.org/memb/unitapp.cfm.

The Executive Council over the summer proposed to change the name of the Society to the American Physics Society to dispel confusion about what the Society is about (the name “Physical” is thought by some to refer to something connected to physical education or fitness). An informal poll among the membership at large favored the change (see past issues of the APS Newsletter). However, a name change is not so easy to carry out as it might seem at first; after it was found out how much work was required from a legal standpoint, this project was abandoned. It was decided to leave the name unchanged and add at the bottom of the current logo the word “physics.”

Education and Careers

If you are concerned with the status of programs granting advanced degrees in Physics, you might be interested in the following item.

Dr. Renee Diehl (Pennsylvania State University) summarized the report of the joint APS-AAPT Task Force on Graduate Physics Education. Several issues about physics graduate education emerged in the last decade:

- There is a perception that physics is fractionalized. Physics has become a more interdisciplinary field, yet the physics curriculum has hardly changed in the last 50 years.
- There is more competition for graduate students from other countries that have taken steps to improve their graduate programs.
- There is a concern whether scientific ethics is taught effectively.

The task force surveyed institutions with graduate programs in physics and received information from 137 such programs. It evaluated a range of issues from the textbooks used in core courses, to the types of entrance (qualifying) exams, and to the level of training in emerging issues such as communication effectiveness and ethics. It made several recommendations on how to improve the curricula. The report can be found at: http://www.aps.org/educ/grad/
There is a shortage of physics teachers. Of the teachers who teach physics in high schools, only 30% have a degree in physics. Of the students in high schools, 30% take physics courses, as opposed to 60% who take chemistry and 98% who take a biology course. There are a few initiatives to improve this situation, such as the PhysTEC Program; please visit the APS – Education website for details (http://www.aps.org/educ/program.cfm) and become familiar with them, as they can be a tool to recruit student in Physics programs.

Alan Chodos of APS summarized the activities (such as: Physics Quest, Eratosthenes, and Physics on the Road) that took place in the US in celebration of the centennial of Albert Einstein’s miraculous year. See the APS Website or http://physics2005.org/ for details.

Public Affairs

As customary at these meetings, Mike Lubell, Director of Public Affairs at APS, gave a presentation on the President’s proposed budget (fiscal year 2006) for research. Research funding is facing another year of very slight growth with cuts to R&D programs outnumbering increases. The level of NSF funding has increased and is back to where it was two years ago (fiscal year 2004), while DOE funding for basic science is facing cuts. He noted how Republican congresspersons who used to be very supportive of science have not been so lately. He urged members, and especially Republicans, to contact Republican congresspersons for sponsoring a strong budget for the basic sciences.

As noted before, contacting your congressperson is very effective. Therefore, contact your congressperson using language drafted by the APS. It is easy and takes about 2 minutes of your time. See the following Web site for instructions: http://www.congressweb.com/cweb4/index.cfm?orgcode=APSPA.

You are encouraged to check the APS’ Public Affairs Webpage regularly: http://www.aps.org/public_affairs/index.cfm. It contains information about legislation that affects our profession, from appropriation of federal funds for research to problems with issuing visa to foreign students and scholars, and to answering the challenges to “dilute” the teaching of evolution. From time to time, APS takes position on a number of issues involving physics and public policy. Examples include a Boost-Phase Missile Defense Study, released in October 2004, and a statement on Electric and Magnetic Fields and Public Health (April 2005). A list of statements can be found at http://www.aps.org/statements/, while for reading studies that the Society commissioned, see: http://www.aps.org/public_affairs/popa/popa-studies.cfm.

—Gianfranco Vidali

On Friday February 17, Gianfranco Vidali (Councilor) and Bob Pompi (Vice Chair) joined other APS Units officers from across the country in visiting elected members of Congress. The purpose of the visits was to request support for the President’s budget proposal to double NSF funding for the physical sciences over a ten year period (8% this year), increase the NIST budget by 18% (this year), and the DOE Office of Science by (14% this year). In 2004, DOE provided 39% of the funding for physical sciences research. NSF provided 13%, NIST 3%, and NASA 22%. There is now the realization in Washington that investment in the physical sciences is absolutely crucial if the United States is going to generate the new ideas which will in turn generate the new products producing new jobs and a different approach to prosperity in an increasingly competitive world.

In 2005, the National Academy of Sciences published a report “Rising Above the Gathering Storm” which evaluated the performance of the US and emerging economies in terms of R&D investment, Ph.D.s awarded, and science and engineering articles. Industrial, academic, and government laboratory leaders participated in the preparation of the report. It became very clear that the US is becoming less competitive as emerging economies rapidly increase their R&D investment. The US has seen its percentage of the high-tech export market decrease from 31% to 18% over a twenty-year period. All indicators point to the fact that support for basic research in the physical sciences must increase if we are to remain globally competitive.

The message has at last been heard in Washington and the administration has proposed the increases indicated above. The problem is that the overall budget is flat and, consequently, other funded areas have been cut and their advocates are starting to make considerable noise. We went to the Hill to tell our representatives how important the funding increase was after so many years of flat or declining support. In return we were informed that it is extremely important for our colleagues back in New York to let their elected federal representative know how much we would appreciate the support of these budget initiatives. We cannot surrender the field to other interests. A proposed budget is just that. We have to generate the votes required to make a proposal into reality.

Please take the time to contact your Senator or Representative. The link is: www.congressweb.com/cweb4/index.cfm?orgcode=APSPA. Entering your zip code will produce the names of your Representative and Senator. Mike Holland of the House Science Committee was very blunt when he informed us that a window on increased physical science funding has been opened. It is our responsibility to let our representatives know how important that window is to us. If we remain silent, the window can close.

—Bob Pompi and Gianfranco Vidali
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Members of the Executive Committee at a recent meeting (left to right): Jim Owens, Mike Rogers, Roman Kzerashvili, Scott Heinekamp, Kiko Galvez, Larry Brehm, Larry Josbeno, Bob Pompi, Gianfranco Vidal and Mike Kotlarchyk.

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Providing information and communicating physics related events and current NYS affairs.

The newsletter will be posted at
www.aps.org/NYSS.

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