

City College among Top Producers of Physics Graduates

The City College of New York is a top producer of physics graduates in the nation, according to the American Institute of Physics. City College's physics department is on a list of programs recognized by the AIP for conferring the largest number of undergraduate physics degrees between 2012 and 2014.

Northern Arizona University, Miami University, University of Massachusetts and University of Texas are some of the institutions that make the list. It was compiled from data collected by the AIP in its annual AIP Enrollments and Degrees survey.

AIP's validation confirmed the growth and quality of the physics program at the college, asserted Dr. Alexios Polychronakos, chair of CCNY's physics department. "In recent years, we've seen our enrollment increase tremendously and we've seen an increased interest by incoming students to pursue science majors and, in particular physics," said Polychronakos. "In addition, the quality of research done and the instruction offered by our world class faculty are both outstanding."

Cummins Lecture

The third Hermann Z. Cummins Lecture was presented on April 17, 2015 by Dr. Steven Chu, 1997 Physics Nobel Laureate, William R. Kenan, Jr. Professor of Humanities and Sciences and Professor of Molecular and Cellular Physiology at Stanford University, and former Secretary of Energy in the Obama Administration.



The first 40 minutes of his talk, "*Microscopy 2.0 plus Energy and Climate Change*," focused on a "revolution in optical microscopy" that is

providing novel tools for exploration in biology and medicine. In the final 20 minute segment, Professor Chu

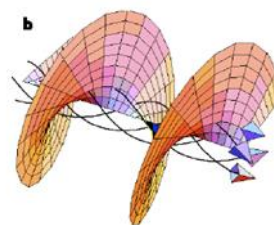
talked about energy, climate change, and ways to make transition to a sustainable world. The event drew a wide audience not only from the Physics Department, but also from other departments of CCNY, sister institutions in New York, and CCNY Physics alumni.

Hermann Z. Cummins (1933-2010) was a Distinguished Professor of Physics at the City College of New York. The lecture is sponsored by the Cummins Memorial Fund and the City College Fund.

International Conferences Held

City College campus is much quieter during summer than during the semesters. However, for the first week of August 2015, one could see many unfamiliar faces in the campus engaged in animated discussions on 'complex light,' 'metamaterials,' 'plasmonics,' and so on. The invaders were the participants of two international conferences held in the CCNY campus and led by two Physics faculty members.

International Conference on Orbital Angular Momentum (ICOAM), 2015: ICOAM 2015, the third in the annual series, was organized by Robert Alfano (CCNY), Giovanni Milione (NEC Laboratories America), Enrique "Kiko" Galvez (Colgate University) and David



Andrews (University of East Anglia, UK). The conference, held on 4-6 August 2015, provided a forum for scientists and engineers from home and abroad, academia and industry working on orbital

angular momentum of light to identify new developments in the field and foster research collaborations.

Optical beams with higher angular momentum have helical wave front and polarization states in the beam profile to store information. Optical angular momentum has attracted recent interest because of application potentials in a myriad of scientific fields including optical fiber, free space and quantum communications, optical trapping, biomedical photonics, and super-resolution

imaging. Over 150 oral and poster presentations were given at the conference.

(Contributed by R. R. Alfano)

META 2015 Conference: Vinod Menon was the Co-Chair of the META 2015 conference, the sixth in the annual series that focusses on metamaterials, photonic crystals, and plasmonics. Specifically, META 2015 addressed topics, such as, metasurfaces, self-assembled metamaterials, topological effects, new plasmonic materials, and light-matter interaction in nanocavities. A newly-introduced sub-topic on quantum photonics covered aspects, such as, NV centres in diamond, structured light and topological photonics. A special symposium on Industrial applications of metamaterials was also organized.

The four day conference had over 700 attendees from over 40 countries and was the largest of the series to date. The sessions were held primarily in the NAC building with some sessions in the ASRC as well.

(Contributed by Vinod Menon)

Interdisciplinary Colloquia Series Launched

The Physics Department initiated a series of special Interdisciplinary Colloquia in 2015 spring, financed in part by a modest grant from the President's office. The goal was to give our students and faculty the perspectives of physicists (or related scientists) who followed a non-conventional path in life and could bring in a new perspective, as well as foster contact with faculty from other departments or divisions.

This series has proved a smashing success! We had a string of well-known and exciting speakers delivering lectures of general interest, attended by a wide audience of CCNY faculty, students and (importantly) alumni. In spring 2015 we had lectures by: **Michael Lubell** (Director of Public Affairs at the American Physical Society and Professor of Physics at CCNY) entitled, "*Science Challenges and Opportunities in a Populist Era*;" **Dennis Overbye** (The New York Times Science Editor) on "*Adventures of a Dinosaur in the Media World*;" **Emanuel Derman**, (Director of Financial Engineering at Columbia University and Partner at Prisma Capital) on "*The Intelligent Student's Guide to Pricing and Hedging*;" and **Joseph Pimbley** (Principal at Maxwell Consulting) on "*Banking on Physics*."

In fall 2015 we had lectures by: **Larry Abbott** (Professor and Co-Director of Center for Theoretical Neuroscience, Columbia University) entitled "*Predictive Neural Circuits in the Fish and Fly*;" **Alan Sokal**, (Professor of Physics at New York University) on "*Physics Envy in Psychology: A Cautionary Tale*;" **Roger Prince** (Scientist at ExxonMobil Biomedical Sciences) "*A Biologist in the Oil Industry*;"

Garry Gladding (Professor Emeritus at University of Illinois at Urbana-Champaign) on "*Reforming Introductory Physics Instruction at a Research University*." We plan to continue this series into the future. Anyone with a good idea about a speaker or a topic is invited to contact the Physics office and tell us about it.

(Contributed by Alexios Polychronakos)

Alfano Garner's Biophotonics Award

Robert Alfano, Distinguished Professor of Science and Engineering, is the 2016 recipient of the Michael S. Feld



Biophotonics Award given by the Optical Society of America (OSA). The Feld Biophotonics Award was established in 2012 in honor of Professor Michael Feld of MIT for his "fundamental contributions to application of photonics technologies to solving biomedical problems."

Professor Alfano is recognized "for leadership and pioneering contributions in the field of biophotonics, comprising the diverse use of label-free native fluorescence, Raman spectroscopy, and optical imaging for cancer detection in tissues and cells." The award includes a certificate and an honorarium of \$3,000. Professor Alfano received many awards including the Charles Hard Townes award of OSA, and Arthur L. Schawlow Prize in Laser Science awarded by the American Physical Society (APS) over the years for his contributions to ultrafast lasers, time-resolved spectroscopy, supercontinuum generation and their applications. He is a fellow of the American Physical Society (APS), Optical Society of America (OSA) and Institute of Electrical and Electronics Engineers (IEEE).

Double Crown for Sue Turner

Our Office Manager Sue Turner garnered two awards: the



CCNY President's S.T.A.R. award and the 2016 Administrative Staff Service Award of the Alumni Association. The S.T.A.R. award for outstanding Service, Teamwork, Action, and Results is an annual award presented to up to three full-

time staff members (excluding teaching faculty and executive compensation staff) to highlight and recognize the importance of staff participation. President Lisa Staiano-Coico presented the prize and plaque for the S.T.A.R. award on May 4, 2016.

The Alumni Association award recognizes Sue's contributions to the department's students. The award will be presented during the Alumni Association's 164th Annual Meeting on June 9, 2016. We congratulate Sue on these great honors and thank her for helping to make our department strongly supportive of our students.

Physics Club Outreach Activities

The graduate and undergraduate physics clubs of the City College of New York initiated a program to reach out to the neighborhood middle school and high school students in the fall semester of 2015. As a continuation of that program, the clubs hosted 20 students from America Scores NY and P.S. 325 on February 26. Club members showed the school students various physics demonstrations, such as, a superconductor train set, which literally floated over its track; a model Van de Graaf generator, and angular momentum conservation, among others.

High school students from another local youth organization, New York Math Academy, also helped to present the demonstrations. These high schoolers are working with CCNY undergraduate and graduate Physics students to build and present new demonstrations for future events. The physics clubs will be holding many



more of these events in the future, and invites fellow students to join the effort. The club members may be reached at: GraduatePhysicsClub@gtest.cuny.edu

(Contributed by Veeshan Narinesingh)

Faculty activities and Achievements

New Platform for Nanoscale Thermal Measurements

A team led by Professors Carlos Meriles and Elisa Riedo recently reported on a versatile platform for nanoscale thermal measurements based on a combination of magnetic resonance, and optical and atomic force microscopy, in *Nature Communications*. Their paper,

“Imaging thermal conductivity with nanoscale resolution using a scanning spin probe,” is based on a simple notion that a hot probe in contact with a thermally conductive material, such as a metal, cools down because heat flows from the probe into the material. The latter is prevented, however, if the sample material is thermally insulating, implying that one can infer the sample thermal conductivity by continuously monitoring the probe temperature.

To implement this idea at the nanoscale, the researchers used a thermal atomic force microscope, where the cantilever temperature can be adjusted via the application of an external current. The AFM cantilever hosts a sharp tip that makes contact with the substrate on a small, nanometer-size area. To measure the tip temperature, the team attached to the tip apex a diamond nanocrystal, whose thermally-dependent fluorescence effectively made it a tiny thermometer. Nanometer-resolved thermal conductivity maps were then obtained as the tip was scanned over various substrates of heterogeneous composition.

Multiple applications ranging from fundamental problems of heat flow in nanostructures and radiative heat transport in nano-gaps, to the characterization of materials undergoing heterogeneous phase transitions, to the investigation of catalytic exothermal reactions of the approach are anticipated.

Half-light Half-matter Quasiparticles

The research group led by Professor Vinod Menon recently reported on the formation of half-light half-matter quasiparticles in atomically thin semiconductors in *Nature Photonics*. The first author of the paper, Xiaoze Liu received his Ph. D. recently and is currently pursuing his postdoctoral research at UC Berkeley. In another recent breakthrough, Menon group demonstrated the use of metamaterials for practical light emitters. This work appeared in the journal *Optica* and was highlighted in a New York Times article. Tal Galfsky, a current doctoral student, is the first author of this work. These two publications were also highlighted by the National Science Foundation in their breakthroughs section.

Menon and Ghaemi win Emerging Frontiers Grant

Professor Vinod Menon, in collaboration with Assistant Professor Pouyan Ghaemi, won a \$2 million National Science Foundation Emerging Frontiers in Research and Innovation grant for the project, Excitonics and Polaritonics using 2D Materials. The focus of four-year project is to develop the next generation of photonic and electronic systems and sub-systems that exploit the unique advantages of atomically thin (graphene-like)

semiconductors. The research team also includes Professors Marc Baldo, Dirk Englund and Jing Kong of the Massachusetts Institute of Technology.

New Faculty Member

Javad Shabani joined CCNY in July 2015. He obtained his undergraduate degrees in Physics and Electrical Engineering from Sharif University of Technology in Tehran, Iran in 2004. He obtained his Ph.D. from Princeton University in 2011. He then held postdoctoral positions at Harvard University (2011-2012) and at University of California, Santa Barbara (2012-2015).



Dr. Shabani's research in experimental condensed matter physics is focused on quantum phenomena that could be controlled in low dimensional systems. His work spans from studying novel states in fractional quantum Hall effect in two-dimensional electron systems to manipulation of quantum states in quantum bits (qubits). By combining quantum materials and device properties, Dr. Shabani addresses some of the fundamental challenges in condensed matter physics. For example, his work on two dimensional epitaxial superconductor-semiconductor materials offers a new platform for scalable quantum circuits. Recently, he received an Early Career grant from Air Force and an Army Young Investigator grant to work on quantum computation.

Dr. Shabani's research also aims at the development of a viable III-V semiconductor-based technology of quantum devices with applications ranging from high-speed and power-efficient digital logic applications to low-noise and sensitive qubits. His contributions in fabricating high electron mobility transistors and the study of most disorder-sensitive physical phenomena (e.g., quantum Hall effect, metal-insulator transition) have led to a better understanding of potentials and limitations of current semiconductor technologies and ways to improve them.

Outstanding Teaching Assistant: Aline Hubard

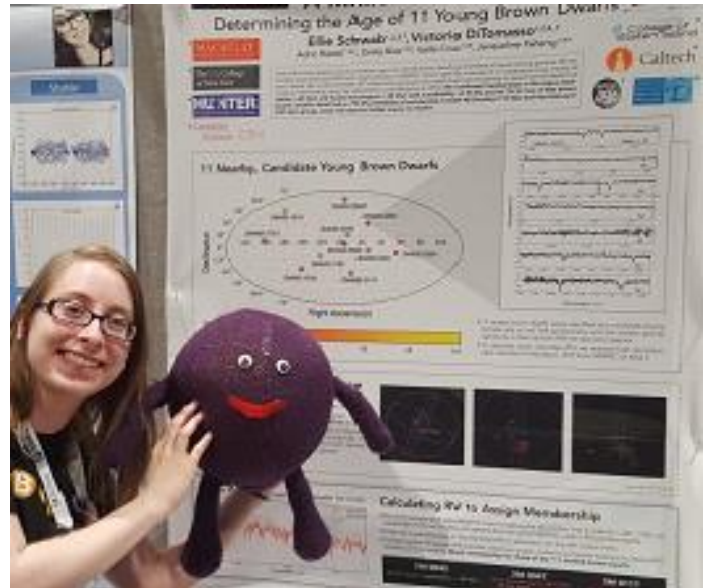
American Association for Physics Teachers (AAPT) recognizes the graduate Teaching Assistant who contributes outstanding teaching abilities to the Introductory Physics laboratories and recitations. **Aline Hubard** has recently been so recognized by AAPT. Ms. Hubard's research



interests are in Condensed Matter Physics, Materials Physics and Fluid Dynamics. Professor Mark Shattuck is her mentor.

Ellianna Schwab is a winner of Chambliss Astronomy Achievement Student Award

Ellianna Schwab, won a Chambliss Astronomy Achievement Student Award for her poster, "*A Million Years Young: Determining the Age of 11 Brown Dwarfs*" presented at the 227th meeting of the American Astronomical Society (AAS) held in Kissimmee, Florida 4-8 January, 2016. The awards are given "to recognize exemplary research by undergraduate and graduate students who present posters at meetings of the AAS." Ellie's poster was based on her summer research investigating a sample of eleven nearby, candidate young brown dwarfs with Victoria Ditomasso (Hunter College), Dr. Adric Riedel (Caltech), and Dr. Emily Rice (College of Staten Island and American Museum of Natural History) as part of the research collaboration Brown Dwarfs in New York City (BDNYC).



Brown dwarfs are sub-stellar objects that form from a collapsing cloud of dust and gas, but, unlike stars, do not have the mass-luminosity ratio which would allow scientists to easily calculate a star's mass, spectral type and lifetime from optical observations. One approach for calculating a brown dwarf's age is by assigning membership to young moving groups containing more massive stars that have established evolutionary cycles. By calculating the ages of the stellar members in the group, the ages of the brown dwarf members can be established. Membership placement requires knowledge of an object's parallax distance, proper motions, and radial velocities. While proper motions and parallax distances are more easily calculated from low-resolution spectra and photometry, radial velocities require pixel by pixel cross

correlations of high-resolution spectra. After reducing the high-resolution data, Ellie and Victoria calculated the radial velocities for the eleven brown dwarfs in the sample, and confirmed young moving group membership for three of the dwarfs. They found that these three were indeed young dwarfs, ranging in age from 30 million to 257 million years.

(Contributed by Ellianna Schwab)

Undergraduate Students Receive Awards

The Physics Department gives out several awards and scholarships to undergraduate students every year. The awards for 2014-2015 Academic Year were presented on May 7, 2015. **Anastasia Spiridonova** received the **Sidney Millman Scholarship** that is *presented to the junior Physics major demonstrating high potential*. The **Sonkin Medal** was awarded to **Ali Eltareb** for demonstrating *the best performance in the Physics laboratory course(s) and/or in experimental research*.

Rajshekhhar Basak received the **Ward Medal** that is *presented to the graduating physics major with the highest GPA in physics and mathematics courses*. **Halley Aycock-Rizzo** is the recipient of the **Bernard Hamermesh Scholarship**, which *recognizes the outstanding graduating Physics major, who has demonstrated some of the skills, knowledge, technique and imagination necessary for a successful Experimental Physicist and who shows promise of being an active contributor to the research efforts in some branch of Experimental Physics*.

Frank Ashmun received the **Gerry A. Gelbwachs Scholarship** that is *awarded to the Physics major demonstrating academic excellence and high potential to benefit society*. **Martin A. Tiersten Scholarship** *recognizes the students with the highest performance in Mechanics (Physics 35100)*, and the recipients of the scholarship this year are: **Allen Kim**, and **Lukas Lindwasser**. **Harry Soodak Scholarship** given to *the outstanding junior physics major who wants to pursue a career in Physics* went to **Sung Soo Jang**. The students graduating with *Research Honors* in Physics are **Rajshekhhar Basak**, **Ali Eltareb**, **John Lin**, and **Raubern Totanes**.

The **Zemansky Introductory Physics Prize** *recognizes outstanding scholarship in Introductory Physics 20700 or Physics 20800 courses*. Thirty two students received the award in the 2014-15 academic year. Students demonstrating *outstanding scholarship in both Introductory Physics 20700 and Physics 20800* receive the **Zemansky Introductory Physics Prize, Honorary** and the recipients are: **Michael Antia**, **Chen Chen**, **Shawn Mathew** and **Rafael Uryayev**.

Recent PhD's

Lin Bo completed the requirements for his Ph. D. in September 2014. Professor Hernan Makse supervised his Ph. D. thesis, *"Message Passing Techniques for Statistical Physics and Optimization in Complex Systems."*

Weikang Chen conducted research for his Ph. D. thesis, *"Dynamics of Nanoparticles in Fluids and at Interfaces,"* under the tutelage of Professor Joel Koplik. He received his degree in September 2014.

Wei Liu defended his Ph. D. thesis entitled, *"Spontaneous Time-Reversal Symmetry Breaking in Two Dimensional Electronic Systems,"* for September 2014 degree. Professor Alexander Punnoose was his mentor.

Xiaoze Liu also is a recipient of the September 2014 degree. His Ph. D. thesis, *"Control of Exciton Photon Coupling in Nano-structures,"* was conducted under the supervision of Professor Vinod Menon.

Bernard H. Everson completed his Ph. D. degree requirements for the February 2015 degree. Professor Ronald Koder supervised his thesis research entitled, *"De Novo Design and Engineering of Functional Metal and Porphyrin-binding Protein Domains."*

Mark R. Kanner defended his thesis, *"Geometry and Statistics of Jammed Granular Matter"* to graduate in February 2015. He carried out his research under the supervision of Professor Mark Shattuck.

Shiqi Li also graduated in February 2015. His thesis, *"Strongly-correlated 2D Electron Systems in Si-MOSFETs"* was carried out under the tutelage of Distinguished Professor Myriam P. Sarachik.

Xuyu Zhu's thesis, *"Using Multiconformation Continuum Electrostatics Model for pKa and Proton Transfer Pathway Calculations in Protein"* for the February 2015 degree was supervised by Professor Marilyn Gunner.

Professor Sergey A. Vitkalov supervised **Scott A. Dietrich's** thesis, *"A Static and Dynamic Investigation of Quantum Nonlinear Transport in Highly Dense and Mobile 2D Electron Systems."* Dr. Dietrich received his degree in May 2015.

Professor Marilyn Gunner supervised **Jianxun Lu's** thesis, *"Proton Pumping in Cytochrome c Oxidase."* Dr. Lu graduated in May 2015.

Zhonghua "Lukas" Zhao defended his thesis, *"Disorder Effects in Charge Transport and Spin Response of Topological Insulators,"* to satisfy requirements for the May 2015 degree. Prof. Lia Krusin-Elbaum supervised the research.

Kelly N. Greenland defended her thesis, “*Biophysical Characterization of a De Novo Elastin*,” to satisfy requirements for the September 2015 Degree. Professor Ronald L. Koder supervised her research.

Aline Hubard completed her Ph. D. thesis, “*Friction, Avalanches and Phase Transitions in Granular Media*,” under the supervision of Professor Mark Shattuck. She received her degree in September 2015.

Professor Mark Shattuck also mentored **Zhusong Li** who defended his Ph. D. thesis “*Order and Asymmetry in Jammed Systems*,” for the September 2015 degree.

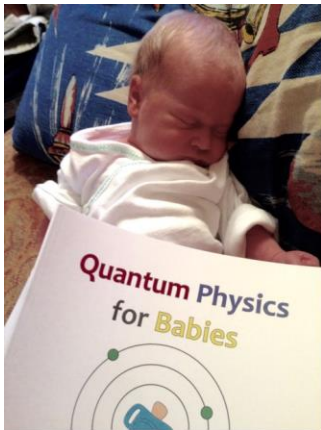
Joel De Jesus defended his dissertation “*MBE Growth of ZnCdMgSe-based Novel Photonic Devices: Intersubband Quantum Cascade Narrow and Broadband Detectors, and Interband Semiconductor Disk Lasers Emitting in the Green*” on November 13, 2015. Professor Maria Tamargo of the CCNY Chemistry Department was his thesis advisor. Dr. De Jesus is currently a scientist at Intel.

Jeff A. Secor defended his thesis “*Ultrafast Spectroscopy and Energy Transfer in an Organic/Inorganic Composite of Zinc Oxide and Graphite Oxide*” to satisfy the requirements for the February 2016 degree. Dr. Robert Alfano, Distinguished Professor of Science and Engineering, supervised his research.

The department congratulates the new Ph. D.s and wish them success in their future endeavors.

Youngest Member!

Dr. James Hedberg and Mrs. Olivia Koski are proud



parents of **Miss Viola Mae Hedberg** born on Thursday, March 24, 2016. We extend our warmest welcome to Viola, and heartiest congratulations to James and Olivia. The accompanying photo-graph shows Viola sound asleep. While it is not certain if “Quantum Physics for Babies” had anything to do with her peaceful sleep, an entrepreneurial colleague

suggested that James seek intellectual property rights for the book anyway!

New Graduate Students

Graduate students in the Ph.D. program, who came to the department in 2015 fall, are: *Francesca Arese Lucini, Xiuhong Cai, Jie Guo, Azeem Ul Hasan, Qiongge Li, Marcelo Nomura, Jonathan Preston, Zhuo Yin and Shihua Zhao*. Students who entered the Master’s program are:

Thomas Brick, Richard Brun, Sahana Das Bhattacharyya, Gustave David Duarte, James Gabriel Malaguit, Henry Meyer, Richard Gustavo Monge, Veeshan T Narineshing, Salah Ezz Salah, Mayra Vialette and Nicholas J Zanata. The department extends warm welcome to these new graduate students.

New Research Associates

Areg Ghazaryan joined Professor Pouyan Ghaemi’s group as a research associate in January 2016. He received his PhD in Semiconductor Physics from Yerevan State University, Armenia in 2011, and continued there as a researcher till 2013. From 2013 to 2015 he was a postdoctoral fellow at the University of Manitoba, Canada. Dr. Ghazaryan’s research interests are in the theoretical investigation of interaction effects in semiconductor nanostructures and novel two dimensional materials, particularly related to fractional quantum Hall effect, physics of excitons and Majorana quasiparticles.

Jared Day and **Zav Shotan** are postdoctoral research associates at the Laboratory for Nano and Micro Photonics (LaNMP) directed by Professor Vinod Menon. Dr. Day received his PhD in Physics from Rice University, Texas working on plasmonics under Prof. Naomi Halas. At LaNMP he is working on nonlinear optics and plasmonic microcavities

Dr. Shotan received Ph.D. Physics from Bar Ilan University, Israel working on atom cooling experiments. At LaNMP he is working on cavity Quantum Electrodynamics using two-dimensional semiconductors.

In Memory

Erich Erlbach
(1933 – 2015)

Professor Erich Erlbach, a member of the Physics Department from 1962 until his retirement on June 6, 1995, died on Friday May 29, 2015.

Erich was born in Wurtzburg, Germany in 1933 to Rabbi Yosef Erlbach and Mrs. Baila Erlbach. Following his mother’s death when he was very young, Erich was raised by his stepmother, Rochel Ganz, his biological mother’s cousin. As the Nazi regime made life increasingly oppressive for the country’s Jews, the Erlbachs emigrated, staying for a few years in England before reaching the United States in 1939; they settled into the refugee community in Washington Heights. He attended the Moses Soloveitchik Yeshivah Elementary School and the Bronx High School of Science. He earned his B. A in 1955, M. A. in 1957, and Ph. D. in 1960 from Columbia University. He then worked at the IBM Research Laboratories in Yorktown Heights as a Physicist for two years doing research, mostly on hot electrons in

germanium. He joined the CCNY Physics Department as an Assistant Professor in 1962, was promoted to Associate Professor in 1967 and to the rank of Professor in 1973.

Erich played an important role in the department in many ways. He taught a broad range of courses to students at every level: liberal arts students, premedical students, engineers, physics majors, and graduate students. His particular specialty was teaching the first-year sequences, which he continued to do for many years after his retirement. Professor Erlbach was also a valuable and very active contributor to the running and administration of the Physics Department and of the College. His administrative work includes two terms as Department Chairman (1974-1980), Director of the Honors Program and Director of the Scholar Program from 1981 until his retirement. He also served on the Executive Committee, the Committee on the Reorganization of the College of Liberal Arts and Sciences (CLAS), numerous Doctoral Student Committees, the Curriculum Committee, the Faculty Council of the School of Education, Chair of the Science Faculty Council, the Faculty Senate, and as departmental representative and Alternate Delegate to the Professional Staff Conference, and more. Erlbach translated several articles for the book *Wave Propagation and Group Velocity*, by Leon Brillouin (1960) and co-authored (with Alvin Bachman) the Schaum's Outline book *Beginning Series II: Waves, Electromagnetism, Optics and Modern Physics* (1998).

Dr. Erlbach was an exceptionally active member of his community. He was a Member of the Local Planning Board No. 12 in Manhattan from 1971 to 1975, a Member of the Board of Trustees of Congregation K'Hal Adath Yeshurun serving as its President for more than twenty years, Member of the Board of Directors of Yeshiva Rabbi S. R. Hirsch and President of Washington Heights Inwood Safety Patrol (WHISP).

Erich was hit by a cyclist speeding down Overlook Terrace at 187th Street (near his home) on August 6, 2014. He fought valiantly for his life for many months and died on May 29, 2015. He is survived by his wife, Mrs. Edith Erlbach (who worked in the Physics Department office for several years), daughters Mrs. Baila Willig, Mrs. Esther Mayerfled and Mrs. Naomi Greenberg, and many grandchildren and great-grandchildren.

(Contributed by Myriam Sarachik)

CCNY Planetarium reopened

The reopening ceremony of the CCNY Planetarium on April 19, 2016 was a success! At least 80 students and faculty's members attended the event, filling every seat and standing space of the Planetarium auditorium (see photo). The event was organized by the Physics Department, Division of Science, and SkyWatch

Astronomy Club. Dr. Daniel Greenberger, Distinguished Professor of Physics, presented a general interest talk on Astronomy. Spitz Inc. gave a demonstration of a new digital Planetarium projector system. The audience also enjoyed the display of the Celestron telescope that the department owns.



The SkyWatch Astronomy Club is planning more activities in 2016 fall. Since its first opening in 1973, the CCNY Planetarium has been one of the unique facilities of the department, and had inspired interest of many students in Physics and Astronomy over the years. Professor Greenberger mentioned that it would be nice to modernize the planetarium by replacing the old Spitz optical system by a new digital system!

(Contributed by Henry Hingyin Wong, President SkyWatch Astronomy Club)

The Physics Department is reaching out to its alumni and friends to help support CCNY's programs by contributing to the City College Fund. Please mark your contribution, "For Physics Department Use" and send to: City College Fund, Shepard Hall #166, CCNY, 160 Convent Avenue, New York, NY 10031.

If you would like to receive future issues of the *CCNY Department of Physics Newsletter* free of charge, please fill out the following form:

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