SFU Physicists Share in EPS Prize

The 2013 European Physical Society (EPS) prize for High-Energy and Particle Physics was awarded on July 22nd to the ATLAS and CMS collaborations at CERN, and to Michel Della Negra, Peter Jenni, and Tejinder Virdee for their leadership roles in these experiments. The award is for the discovery of the Higgs boson, announced last July 4th.

On the anniversary of the discovery, ATLAS submitted two follow-up papers on the properties of the newly discovered particle (spin, mass, and couplings), showing that it does indeed have the attributes of the Standard Model Higgs boson. These papers have both been accepted by Physics Letters B.

SFU physicists have made major contributions to ATLAS for well over a decade. Faculty members Dugan O’Neil, Bernd Stelzer, and Michel Vetterli have worked on many aspects of the project and held several positions of responsibility in both ATLAS-Canada and ATLAS itself. The SFU group has been very active in the analysis of ATLAS data, leading several projects: tau-lepton identification and the search for the Higgs boson decaying to taus (O’Neil), searches for new physics and for Higgs to WW decays (Stelzer), as well as jet calibration and jet physics (Vetterli).

Vetterli and O’Neil have played leading roles in high-performance computing for ATLAS. Vetterli is the project leader for the ATLAS Tier-1 Data Analysis Centre at TRIUMF and is a founding co-principal investigator of Westgrid, which is used extensively by ATLAS. He was also a long-time computing coordinator for ATLAS-Canada and has served as the chair of the Collaboration Board for the Worldwide LHC Computing Grid. O’Neil is currently the chair of the WestGrid Executive Board and was a member of the Compute Canada National Initiatives Committee. As a further technical contribution to ATLAS, Stelzer co-led the creation of an online global monitoring system to help ensure the quality of ATLAS data. Stelzer is also working on upgrades to ATLAS for data-taking at higher beam intensities.

Furthermore, O’Neil has been the deputy spokesman of ATLAS-Canada, and Stelzer is currently ATLAS-Canada physics coordinator, a position that O’Neil held previously. Vetterli is spending a sabbatical year at CERN as the chair of the ATLAS Publications Committee, which oversees all journal papers produced by the collaboration. He is also a member of the ATLAS Executive Board.

Other members of the SFU group are postdoctoral fellows Jiri Kvita, Heberth Torres, and Andres Tanasijczuk; and graduate students Noel Dawe, Jamie Horton, Daniel Mori, Michel Trottier-McDonald, and Jacobus Van Nieuwkoop. Former members of the group are postdocs Jyothsna Rani Komaragiri, Michele Petteni, Teresa Spreitzer, and Rod Walker, as well as PhD students Jennifer Godfrey and Doug Schouten, and MSc students Suvayu Ali, Marco Bieri, Michelle Boudreau, Sarah Kerkhoff, Erfan Rezaie, and David Shinkaruk.
Message from the Chair

As you can see from this newsletter, the department has been very busy and productive over the past six months. Read on for an impressive list of awards, events, and comings and goings. The department continues to offer significant matching funds on any new donations to our various scholarships and bursaries. For more information please see http://physics.sfu.ca/about/donations. We are also beginning to think about our department's presence in the 50th year anniversary celebrations of SFU and welcome any suggestions regarding activities to mark this important milestone. If you are interested in serving on our 50th Anniversary organizing committee please let me know. We are especially interested in hearing suggestions and anecdotes from our emeritus faculty, alumni, and retired staff.

Simon Watkins
Professor and Chair

Research Highlights

Levon Pogosian, who returned to campus in September after a year as a visiting scholar and fellow with the University of Cambridge, co-organized the Cosmological Tests of Gravity workshop in March. Hosted by the Beecroft Institute of Particle Astrophysics and Cosmology at the University of Oxford, the workshop attracted 120 participants and featured “discussions focused on recent progress and remaining issues in developing theoretical frameworks for probing gravitational physics with upcoming cosmological surveys.”

Igor Herbut returned to campus in September after a year at the Max Planck Institute for Physics of Complex Systems in Dresden, Germany, where he led an “Advanced study group on topological band structures and their instabilities” (http://www.mpipks-dresden.mpg.de/~asg_ih/). Herbut’s paper with Fakher Asaad of Wurzburg, Germany on electron interactions in graphene was published on August 26th in a prestigious new APS publication, the Physical Review X (http://prx.aps.org). The paper settles a long-standing controversy on the phases of “Hubbard model” on graphene’s honeycomb lattice. It is available along with a popular summary at http://prx.aps.org/abstract/PRX/v3/i3/e031010.

Karen Kavanagh initiated two new projects this summer with local BC companies Ballard and Parkside Optical. Funded by short term Engage grants from NSERC ($25,000 for six months) these projects enable the development of potentially longer collaborative research programs that benefit both university and industrial scientists.

With Ballard, a company that manufactures fuel cells to power transportation vehicles, Kavanagh’s group will carry out transmission electron microscopy investigations of Ballard fuel cell components with the aim of improving the lifetime of these commercial energy sources.

Parkside Optical Inc. is a company that provides inexpensive tools for cleaning expensive optical surfaces. They manufacture various forms of a brush, foam pad, or cloth that removes dust and grease from surfaces such as camera lenses and smart phone screens. Their products are based on the use of a dry powder combined with a micro fibre cloth. The mechanism behind the cleaning process is poorly understood and Kavanagh’s group will investigate the influence of nanopowder composition.

Both projects will involve training of graduate and undergraduate students and fit well with Kavanagh’s overall interests of investigating nano structural electronics.

Holiday Bonspiel!

Department members were asked whether they preferred curling, skating, or something else entirely as the activity for this year’s holiday party. Although there was some interest in skating and suggestions for alternative activities that ranged from a dunk tank to a fancy dress ball, curling was clearly the most popular choice.

Planning for the 2013 Physics Holiday Bonspiel is underway, please watch your email for details!

Faculty Position Available

The full posting for the department’s available faculty position in theoretical soft matter and/or biophysics is available at http://www.physics.sfu.ca/newsnewsitem?id=79.
Department Hosts WIPC 2013

The department played host to participants from throughout Canada and the United States at the third annual Women in Physics Canada 2013 conference. Organized by PhD students Donna Hohertz, Zahra Lotfi Mahyari, Dorna Niroomand, and Fatemeh Rostamzadeh Renani and Senior Lecturer Sarah Johnson, the conference ran from July 25th through 27th at the Burnaby campus and featured talks by department members Corina Andreoiu, Barbara Frisken, and Karen Kavanagh.

Originally organized by a group from the Perimeter Institute and the Institute for Quantum Computing in Waterloo, Ontario, the first Women in Physics Canada conference was held in 2011. Aimed at young women in all areas of physics, the conference seeks to address the underrepresentation of women in the field of physics—in 2010, 19 percent of physics PhD recipients in Canada were women—by giving participants an opportunity to present their research and to network with other female physicists. Such opportunities work toward the goals of building a strong community of women physicists across Canada and aiding in recruitment and retention of women in physics and related fields.

PSA Builds Tesla Coil

The Physics Student Association (PSA) has undertaken a build project that is allowing members to develop new skills while sharing physics information with members of the larger University community.

The PSA’s Tesla Coil build, which is based on Steve Ward’s design (http://www.stevehv.4hv.org/new_driver.html), was originally slated to start on the 157th birthday of Nikola Tesla, who was born on July 10th, 1856. Although a delay in parts delivery postponed the project start date by two weeks, cake was available so Tesla’s actual birthday did not pass without recognition.

Working in the Build SFU room, the PSA has drawn much attention from the general SFU community and members have had an opportunity to educate others about Tesla’s work. The Association’s Vice-President, Brandon Denis, reports that the group is “a few solders away from finishing the main driver.” Denis emphasized the learning opportunity the project has presented for participants. “Most of the people who started on the project had almost no experience in soldering, and limited hands-on practical electronics experience. Now, everyone is practically an expert solderer, and has an understanding in electronics far surpassing that they had at the start of the build.”

The Tesla Coil project is open to all undergraduate physics students at SFU. The PSA encourages those who are interested to join the Physics Student Union Facebook page to learn more about when the group will be getting together and to keep informed about future projects—given the success of this one, the Association hopes to undertake similar builds in the near future: https://www.facebook.com/groups/physics.psa.sfu/.

Shohini Ghose of Wilfrid Laurier University’s Department of Physics and Computer Science, presented a TEDx-style “After-Dinner” talk, “Anna Einstein”, at the conference’s banquet dinner on July 26th. Ghose discussed her talk on CBC Radio’s “On the Coast”; the complete interview is available at http://www.cbc.ca/player/Radio/Local+Shows/British+Columbia/On+The+Coast/.
TA Training, Specialized for Physics

The department introduced a new TA training initiative this Fall. Organized by Daria Ahrensmeier, Sarah Johnson, and Jeff McGuirk, the Physics TA Orientation was a five-hour introduction to topics of interest designed particularly for the needs of first-time TAs.

The session took place on Friday, September 6th, and started with a discussion of what it takes to be a good TA. Participants shared their own views and experiences and heard stories and tips from experienced TAs.

TAs also learned how undergraduate student demographics at SFU can impact their work, and received useful information about their rights and responsibilities as TAs from the TSSU stewards for the Physics Department.

Next on the schedule was a hands-on parallel session on how to run tutorials and labs. After reviewing some ground rules, the participants had the opportunity to practice typical situations they will experience as TAs, some of them in role play: keeping students engaged, resolving conflicts within student groups, giving useful feedback, and best practices for marking.

The session ended with a round table on how to deal with cultural and other diversity, once again with illuminating contributions from several experienced TAs.

Most of the participants will continue learning about teaching physics in the new graduate course PHYS 802, Introduction to Graduate Studies: Research and Teaching in Physics, which launched last Fall. Three sessions of the course are devoted to Physics Education Research.

A big thank you to everybody who made this event a success (and a lot of fun), especially to the organizers and all the graduate students who

Contact Us

Keep in touch with Physics!
Email physcsec@sfu.ca to be added to our newsletter email list.
We are on Facebook!
https://www.facebook.com/SFUPhysics

Canadian Association of Physicists

- Is a national network of 1600 physicists working in Canadian educational, industrial, and research settings;
- Is a strong and effective advocacy group for support of, and excellence in, physics education and research;
- Is a sponsor and supporter of physics events and activities in Canada, including:
  o the CAP annual congress,
  o our journal: Physics in Canada,
  o the Canadian Undergraduate Physics Conference,
  o physics prize exams, and
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- Represents the voice of Canadian physicists in government, to granting agencies, and to international societies.

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Milestones

Comings & Goings

- **Pat Mooney** retired at the end of September, after more than eight years with the department as a Professor including a seven-year term as a Tier I Canada Research Chair. Mooney will continue with the Physics department as Professor Emerita.

- **Chang Min Kim** joined the department as a Research Technician. Kim completed his MSc in 2011 under the supervision of John Bechhoefer.

- **Daria Ahrensmeier** joined the department as an Associate Member. Ahrensmeier is SFU’s Teaching and Learning Centre’s Educational Consultant for the Faculty of Science.

- **Zhiyi Liu** joined the department as an Adjunct Professor. Liu, who completed his PhD at SFU in 2009 under the supervision of Dugan O’Neil, is a staff scientist at TRIUMF working on applications of high energy and nuclear physics to geological resource survey applications.

- New graduate students **James Beare** (previous institution: Waterloo), **Megan Boothby** (Connecticut), **Michael Chomitz** (Trent), **Carlos Gomez** (SFU), **Sean Graham** (Waterloo), **Lavisha Jindal** (Indian Institute of Technology Madras), **Nicholas Lee-Hone** (McGill), **Mpumelelo Matse** (African Institute for Mathematical Sciences), **Eric Schibli** (UNBC), and **Chen Tang** (Manitoba) started programs in September.

- **Rachel Wortis** of Trent University’s Condensed Matter Physics group will visit the department for the 2013-14 academic year.

Awards & Accomplishments

- **Sarah Johnson** received a Faculty of Science Excellence in Teaching Award for 2011-12. Johnson was also named a Faculty Teaching Fellow, in which capacity she works with the Dean of Science to define priorities for supporting teaching and learning in the Faculty. Physics Chair Simon Watkins cites Johnson’s record of “continued efforts to improve first-year teaching at SFU and then document and quantify the effects of various teaching strategies” as particularly impressive.

- **Malcolm Kennett** received a Faculty of Science Excellence in Teaching Award for 2012-13. Physics Chair Simon Watkins notes that Kennett receives consistent praise from students for his communication and organizational skills, and is recognized for his ability to increase students’ appreciation for difficult subjects.

- **Christoph Herrmann** received a Faculty of Science Excellence in Teaching Award (Teaching Assistant) for 2012-13. Herrmann, who is completing his PhD with supervisor Karen Kavanagh, was recognized by nominator Nancy Forde as “that rare instructor who is genuinely able both to convey deep knowledge about the material and to be popular with the students”.

- **Pat Mooney** was named a Fellow of the Royal Society of Canada. SFU’s Vice-President of Research Mario Pinto notes that “in addition to being a tremendous personal honour, this achievement reflects favourably on SFU and its strengths in material physics research.”

- **Dugan O’Neil** was appointed Chair of NSERC’s Subatomic Physics Evaluation Section. O’Neil will complete a one-year term as Chair through June 2014, and also continues to chair the Physics Department’s Undergraduate Curriculum Committee.

- **Fatemeh Rostamzadeh Renani** won the 2013 Billy Jones Graduate Award in Physics. Renani is completing her PhD under the supervision of George Kirchzenow and will defend her thesis on October 23rd.

- **Aaron Plahn** was awarded the Robert Frazier Memorial Fellowship. Awarded by Thompson Rivers University, the fellowship recognizes a TRU BSc graduate who is in a graduate program at a Canadian university. Plahn received his BSc from TRU in 2012, and is currently completing his MSc with Levon Pogosian.

- **Aaron Plahn** also won the Canron Limited - Sidney Hogg Memorial Graduate Scholarship and the Sulzer (Bingham) Pumps Inc. Graduate Scholarship.

- **Micah Brush** was awarded the John F. Cochran Physics Award, which recognizes a student who has shown achievement and promise in both experiment and theory through the first two years of study in any physics honours program.

- **Ricky Gill** won the Physics Charter Faculty Prize. Awarded annually to the top graduating student in any major or honours Physics program, the prize was established in recognition of Physics Charter Faculty: John F. Cochran, Konrad Colbow, Richard H. Enns, Robert F. Frindt, Rudi R. Haering, David J. Huntley, J.C. Irwin, Klaus E. Rieckhoff and K.S. Viswanathan.

- **Justin Oliver** won the Rudi Haering Award in Physics, which recognizes an outstanding Physics undergraduate.

- **Polly Tsybina** and **Micah Brush** were awarded Evelyn and Leigh Palmer Scholarships, which are granted annually based on academic merit to undergraduate students in major or honours programs in the physical sciences.

- **Karlene Loudon** received the Patrick D. McTaggart-Cowan Award in Science, which is awarded to a student in the physical sciences on the basis of academic achievement and potential.

- **AJ Koenig** (working with David Broun) took first place for his entry, *Microwaves in a Fridge: Probing Superconductors at High Frequencies*, at this year’s Physics USRA Poster Competition, held on August 9th. Tied for the runner-up position were **Angelina Marinkovic** (Nancy Forde) for *Effects of Chemical Aging on Mechanical Properties of Collagen*, and **Matthew Quenneville** (Dugan O’Neil) for *Neutral Pion Reconstruction in Hadronic Tau Decays*.

Graduate Degrees Awarded

**PhD**


**MSc**

- **Arthur Horton.** The jet energy scale at ATLAS using Z+ jet events. Supervisor: Mike Vetterli.

- **Zahra Mokhtari.** Nonequilibrium dynamics of quantum Ising chains in the presence of transverse and longitudinal magnetic fields. Supervisor: Malcolm Kennett.

Undergraduate Degrees Awarded

**Honours BSc**

- **Kevin Morse.** Major: Physics.

- **Erin Service.** Major: Chemical Physics.

**BSc**

- **Ian Anderson.** Double Major: Physics, Philosophy.


- **Russell Kirchner.** Major: Biological Physics.

- **Thomas Wintschel.** Major: Physics; Minor: Mathematics.
News & Events

Spring Convocation Reception
The department celebrated with the 29 students who received Physics degrees at SFU’s June 12th convocation ceremony. We’ll celebrate with the Fall 2013 graduating class on Friday, October 11th, watch this space for photos!

Pic•A•Nic
The sun shone for the Physics Pic•A•Nic, which took place at Burnaby’s Confederation Park on July 18th. Picnickers took advantage of the giant sports field by the site for rounds of bocce, frisbee, badminton and croquet. Department Manager Jen Chang kept the proceedings musical with her ukulele while glycerin-infused soap bubbles entertained our group as well as a whole crowd of local daycampers. It was a great way to take advantage of a fantastically sunny summer!

Summer Classic
The annual event featuring the USRA poster session, BBQ lunch and softball game took place on Friday, August 9th. Biophysics took on Everybody Else in a nailbiter of a softball game that saw Everybody Else take this year’s title, despite a dramatic last inning Biophysics rally. Thanks to everyone who helped with setup, cleanup, and everything in between, especially to grillmaster David Lee and liquor licence wrangler Derek Sahota.

Welcome Back BBQ
We took a chance scheduling this year’s Welcome Back event on Friday the 13th of September, but aside from some minor camera issues (which were quickly resolved by tech heroes James Lang and David Lee) the event was a great success. Everyone had a chance to recon-
nect after the summer and welcome new members to the department over lunch in the sunshine—nothing unlucky about that!

Girls Exploring Physics
• Friday, October 25, 2013
• http://www.physics.sfu.ca/about/outreach/gep
Registration is now on for the next Girls Exploring Physics workshop for girls in grades nine and ten.

Science Spooktacular
• Saturday, October 26, 2013
• http://www.physics.sfu.ca/about/outreach/spook
Free afternoon of spooky science for kids in kindergarten through grade six and their families. Featuring two presentations of the “Phantom Physics and Cryptic Chemistry” show, at 1:00 PM and 3:00 PM; see website for show reservation information.

TRIUMF Saturday Morning Lectures
• Ongoing through April 26, 2014
• http://www.triumf.ca/education-and-outreach/saturday-morning-lectures
Bernd Stelzer and Martin Zuckermann are featured speakers in this year’s lecture series.

Frontiers in Biophysics
• March 14th & 15th, 2014
• http://www.sfu.ca/biophysics/frontiers/2014/Home.html
Momcilo Gavrilov, Pau Farre, Sherry Leung, Jason Wang and Tristan Hansen are organizers of this conference, which will be held at the Burnaby campus.