

**Attn: Science Dept. Heads, Science & Physics Teachers**  
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*University of  
British Columbia*

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British Columbia Version

# PHYSICS & ASTRONOMY

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Welcome to the 3rd issue of **UBC Physics & Astronomy Outreach Program News!** We've made a few changes that we hope will improve your reading experience. First of all, we now produce two types of our newsletter - a BC and a national version - so our readers can receive the most relevant information. Also, we have gone digital - print copies will no longer be produced in an effort to be environmentally friendly!

Speaking of the environment, check out our **Quick Study** for a 'historical' look at global warming. If you are a teacher, perhaps your students would be interested in competing in the **Michael Smith Challenge, JPEC, Physics Olympiad**, or in considering various academic programs at UBC (including the new **dual degree program in Physics & Education!**). For parents - our **summer camp registration is open!** Register now to ensure that your kids have a spot.

You can subscribe to either the BC or the national version of our newsletter at our website: <http://www.phas.ubc.ca/outreach/web/emailList.php>. Thank you for your interest in Science Outreach and we hope you enjoy the issue!

#### Contact Us

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**Register Now!!**

## The Michael Smith Challenge (National) – March 12<sup>th</sup>

*A Challenge on Logical Thinking for Astronomy, Biology, Chemistry, Earth Science, and Physics*

The Michael Smith Science Challenge is a **national** competition written by students currently taking **Grade 10 Science or lower**. **This event is run at the students' school (hence no travelling!)**. It emphasizes logical thinking, and covers material in the science curriculum common to all provinces. It is named in honour of UBC's Nobel Prize Winner Dr. Michael Smith, and is sponsored by the UBC faculty of Science and NSERC PromoScience.

#### PRIZES:

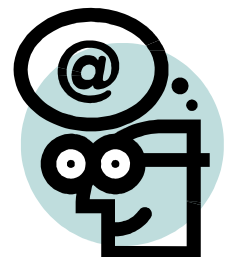
Nationally: 1st - \$500, 2nd - \$250, 3rd - \$100  
Provincially: \$100 for top student without a national prize, \$50 for each student in a tie  
Teachers: \$50 for a teacher with a prize-winning student

**WHEN:** 9-10am Pacific Standard Time, Thursday, March 12, 2009

**COST:** \$5.00 /script (cost of marking one exam)

For more information or to register, visit: <http://www.physics.ubc.ca/outreach/web/smith/>

Contact [mschall@phas.ubc.ca](mailto:mschall@phas.ubc.ca) if you have any question regarding this event!



# Upcoming Events

## Physics Olympiad (Western Canada) – March & April

**WHO:** Canadian high school students from BC, AB, SK, MB, YT, or NT who are under the age of 20 and have never taken university courses.

**WHAT:** Write a selection examination to qualify for the Western Canada Physics Olympiad Weekend camp in Vancouver.

**WHERE:** Details can be found online at <http://www.physics.ubc.ca/outreach/web/olympiadcamp.php>

**WHEN:** The selection exam will be posted online in March; no pre-registration is required. The Olympiad Weekend camp will take place from **April 24-26**.

**WHY:**

- Because solving interesting problems can be fun
- Canada will send a team of five students, who are best of the National Competition, to the **International Physics Olympiad Competition in Mexico in July 2009!!**

If you have any question, or need more information, write to us at: [outreach@phas.ubc.ca](mailto:outreach@phas.ubc.ca)



The 40th International Physics Olympiad will be held in Mexico.

## Junior Physics & Engineering Competition (Greater Vancouver & Lower Mainland) – May 1st

The Junior Physics and Engineering Competition is a design event open to all enrolling Science 8-10 students — the purpose being to build stuff, compete, learn some physics, and have a good time.

This year's events are "**Block and Tackle**" and the classic "**Mouse Trap Car Derby**". In it's 5<sup>th</sup> year, we are expecting between 35 and 40 teams to vie for the JPEC cup. This year's event will be held at UBC on May 1, 2009, and will end with an entertaining physics show, put on by UBC faculty.

Each school can register up to two teams. Competition rules, registration, and other details can be found at [www.junior\\_olympics.phas.ubc.ca](http://www.junior_olympics.phas.ubc.ca).

To register, send your request and 411 to: [mike\\_hengeveld@hotmail.com](mailto:mike_hengeveld@hotmail.com)



**Winners of the 2008 JPEC Cup**  
**West Point Grey Academy**  
David Exel, Ivy Huang, Kyle Sia-Chan,  
Wendy Chai, and Carson Dueck



One of the 2008 activities - Zipline Bomber: Build a device that will roll down a 12 metre clothes-line and drop an egg into a pool of water!

# Upcoming Events

## Phenomenal Physics Summer Camps (Greater Vancouver & Lower Mainland) - July

The **UBC Physics Outreach Summer Camps** are for kids (**Grades 2 - 10**) who enjoy building things and learning new cool science stuff! Come build planes, go SCUBA diving, learn the physics of sound, or build a Martian habitat. We offer four different week long camps that cater to a range of ages and interests. Please check out the schedule and description below. Registration for summer 2009 is online now and operates on a **first come, first served** basis. **Spots fill up fast...So register now!**

To register or for more information, please visit: <http://www.physics.ubc.ca/outreach/web/summercamps/>  
Questions? Email us at [camps@phas.ubc.ca](mailto:camps@phas.ubc.ca)

### Fun with Physics Camp (Grades 2-4) - \$200.00 This camp will be run twice: July 13-17 and July 20-24

- *Have fun with...*building rockets, boats, and airplanes!
  - *Learn about...*molecular structure through crystals, waves with musical instruments, and fluids with tornado tubes!
- The week includes daily outdoor games, two pool sessions, a tour of UBC's telescope, and a physics show with ice cream made from liquid nitrogen!

### Astronomy Camp (Grades 4-6) - \$250.00 This camp will be run once: July 20-24

- *Let's explore our universe!* Build Martian habitats, view stars in a planetarium, and explore the properties of rockets.
  - *How does a telescope work?* Visit UBC's telescope and then build a telescope!
  - *What's it like without gravity?* Discuss weightlessness and experience it during a **SCUBA diving session!**
  - *Excited about new discoveries in astronomy?* Hear the talks by expert astronomers from UBC!
- The week includes two pool sessions, daily outdoor games and the physics show & ice cream party.

### Advanced Physics Camp (Grades 5-7) - \$250.00 This camp will be run twice: July 13-17 and July 27-31 *Up for a challenge ?*

- *Study...* motion with motion detectors and computer graphing software
  - *Build...*a tri-colour flashlights and life sized cardboard boats that floats on water!
  - *Experience...*concepts of pressure and buoyancy through **SCUBA DIVING LESSONS!**
- The week includes two pool sessions, tours of research labs, daily outdoor games, and a fabulous physics show.

### Chemistry, Physics and Astronomy Camp (Grades 8-10) - \$250.00 This camp will be run once: July 27-31

- *Chemistry* - Conduct chromatography experiments, study chemical reactions, and learn about topics in biological chemistry (i.e. DNA and genetics) in a **UNIVERSITY LAB!**
  - *Physics* - Design hovercrafts, build LED flashlights, study and experience amusement park physics, and explore motion using motion detector probe technology.
  - *Astronomy* - Build a planetarium, tour UBC's telescope, and experience weightlessness while **SCUBA DIVING!**
- This week includes two pool sessions, outdoor games, lab visits, guest speakers and the fabulous physics show!



# Outreach & Education Programs 2009



## TRIUMF

Canada's National Laboratory for Particle & Nuclear Physics  
4004 Wesbrook Mall, Vancouver, BC V6T 2A3

## TRIUMF Free Teacher Internships (British Columbia)

Secondary school teachers from anywhere in BC are invited to TRIUMF for a professional development opportunity not to be missed!

### You get:

- 3-7 days at TRIUMF, a world-class subatomic physics research laboratory, to take part in a live subatomic physics experiment
- Travel to/from TRIUMF plus meal costs covered by our travel grant
- Subsidized room (if necessary) at nearby TRIUMF House
- **NEW this year:** subsidy for substitute teachers for locals not requiring travel or housing

### We ask:

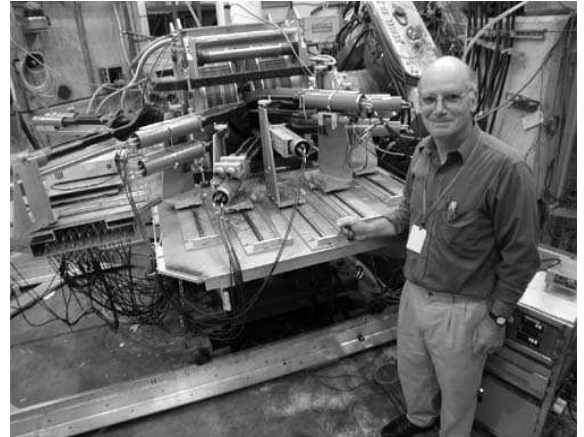
- Only that you provide a teaching resource based on your experience

**What a deal! Internship positions are available for Spring and Fall 2009**

For more information, contact: TRIUMF Outreach Coordinator

Tel: 604-222-7525; Fax: 604-222-1074; Email: [outreach@triumf.ca](mailto:outreach@triumf.ca)

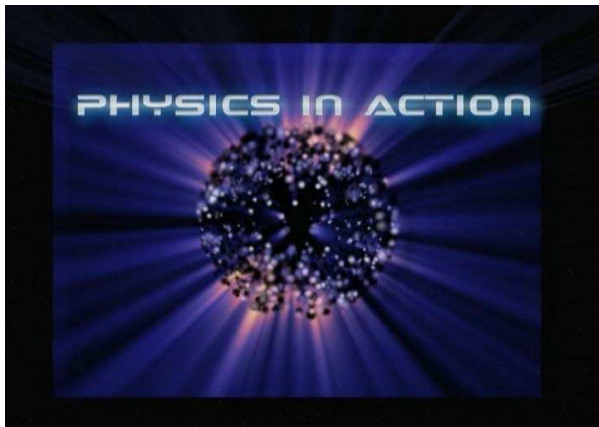
<http://www.triumf.info/>



## Saturday Morning Physics Lectures

TRIUMF and the UBC Dept. Of Physics and Astronomy present a series of public lectures on current issues in physics and astronomy. The lectures are aimed at the level of high school students. Free parking available. Refreshments served.

<http://www.triumf.info/public/students/lectures.php>



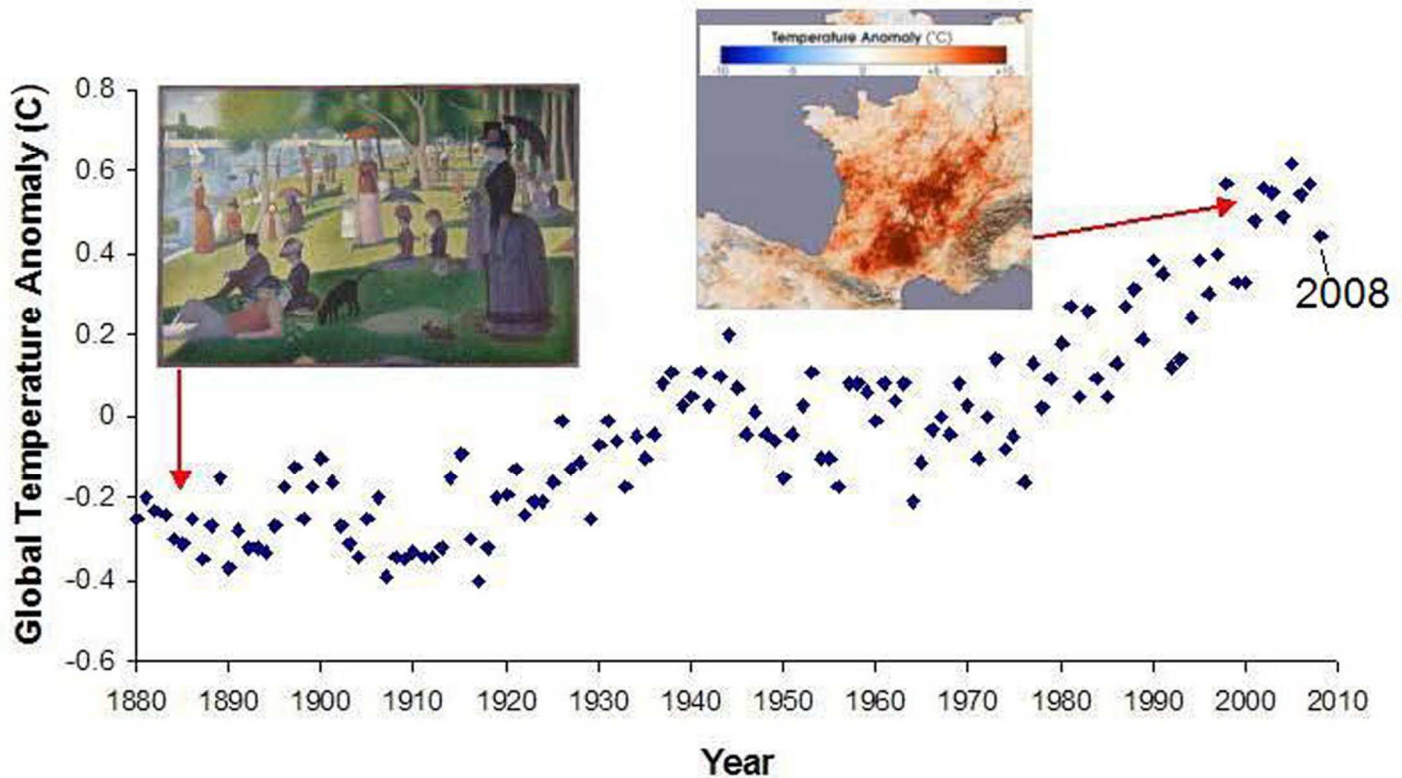
## Physics in Action

TRIUMF is releasing a new educational DVD this season which will use the cutting-edge science and the world's largest cyclotron to teach basic concepts in physics. Pre-order your copy today!!

<http://www.triumf.info/public/students/videos/>

# Quick Study: 2008 - that was the year that was

It may come as a surprise to learn that 2008 was either the 9<sup>th</sup> or 10<sup>th</sup> hottest year globally since instrumental records began in the mid-nineteenth century. The global mean temperature was 14.3°C, compared to 14.0°C for the 1961-1990 average. The ranking of years by temperature, and the uncertainties involved, are nicely laid out on the UK Met Office's website, and this site comments "Globally this year would have been considered warm, even as recently as the 1970s or 1980s, but a scorcher for our Victorian ancestors." It is interesting to ask what effect a changing climate has had on habits of dress. Consider for example Georges Seurat's painting "Un dimanche après-midi à l'Île de la Grande Jatte"; the Parisians sunning themselves seem to be wearing rather more clothing than they do today. Check the plot below and see what the climate was doing in 1884-6 while Seurat was painting it, and compare with 2003 when there were 14,000 deaths from heat stroke in France.



The NASA website gives the raw data (plotted above) and the reasons why North Americans didn't feel much of this heat. La Niña, the cool phase of the El Niño-Southern Oscillation (ENSO), kept us cool, while much of northern Europe and the Arctic were 2°C above the 1961-1990 average. Siberia was 3°C above this average, and the resulting methane emissions from the wetlands there seem to have caused the atmospheric fraction of that potent greenhouse gas to start rising again after a decade of stability.

It is clear from the graph that last year was warmer than any year prior to 1998, and that the 2008 data point takes its place in the general scattered upward rise.

– Chris Waltham 2009/01/19

**Chris Waltham** is a professor in the Department of Physics and Astronomy at UBC. His teaching interests include the physics of energy and climate issues

<sup>1</sup><http://www.metoffice.gov.uk/corporate/pressoffice/2008/pr20081216.html>

<sup>2</sup>[http://en.wikipedia.org/wiki/File:Georges\\_Seurat\\_-\\_Un\\_dimanche\\_apr%C3%A8s-midi\\_%C3%A0\\_l'Île\\_de\\_la\\_Grande\\_Jatte\\_v2.jpeg](http://en.wikipedia.org/wiki/File:Georges_Seurat_-_Un_dimanche_apr%C3%A8s-midi_%C3%A0_l'Île_de_la_Grande_Jatte_v2.jpeg)

<sup>3</sup>[http://en.wikipedia.org/wiki/2003\\_European\\_heat\\_wave](http://en.wikipedia.org/wiki/2003_European_heat_wave)

<sup>4</sup><http://data.giss.nasa.gov/gistemp/2008/>

<sup>5</sup><http://www.agu.org/pubs/crossref/2008/2008GL036037.shtml>

# Academic Programs

## Engineering Physics at UBC

*...Turn Ideas into Reality...*



Engineering Physics at UBC is a **challenging interdisciplinary degree** designed to train those who wish to work at the **leading edge of scientific and technological innovation**. By applying the fundamentals of physics with the practicality of engineering, our students are given the skills to become tomorrow's inventors, technology leaders, discoverers of new science, and developers of new medical techniques.

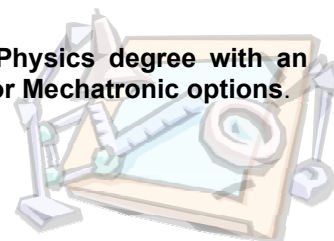
The Engineering Physics program combines an **Honours Physics degree with an Engineering degree in Electrical, Mechanical, Computer, or Mechatronic options**.

For more information, please visit: [www.engphys.ubc.ca](http://www.engphys.ubc.ca)

Or, contact the UBC Engineering Physics Program

Tel: 604-822-6451; Fax: 604-822-5324

Email: [andre@physics.ubc.ca](mailto:andre@physics.ubc.ca) (Director Andre Marziali)



*Passionate about Science but concerned about big first-year classes and impersonal teaching?*

## Consider: UBC Science One Program

An Integrated First-Year Science Program at the University of British Columbia



**Observe...** the natural world and universe around you

**Describe...** use mathematics to speak precisely about the world around you

**Understand...** experience the joy of insight

**Synthesize...** use fundamental principles to form a wholistic view of the subatomic realm, chemical reactions, genetics, ecology, climatology and cosmology

**Apply...** what you have learned to entirely new situations

**Learn...** how to learn

**Think...** like a scientist

**Become...** a scientist

**For more information and on-line application visit our website:**

[www.scienceone.ubc.ca](http://www.scienceone.ubc.ca)

You will be asked to write a short essay describing your passion for science.

A separate application for admission to UBC Faculty of Science is required.

**Academic Requirements:**

Mathematics 12, Calculus 12, Physics 12, Chemistry 12, Biology 11 or 12 (or BC equivalents)

Questions? Contact us at

Email: [science1@interchange.ubc.ca](mailto:science1@interchange.ubc.ca)  
or Telephone: (604) 822-5552

### Program Features:

- Integrated Science
- 1<sup>st</sup> Year (both terms)
- 75 students
- 8 faculty members
- 25 credits + 2 for co-req Bio 140
- Small-group learning
- Proven results

## Dual Degree Program: Mathematics or Physics and Education



### Year

1st	Standard Science
2nd	Physics/Math + Education Seminar & Practicum
3rd	Full Entry

### Special Program Features:

- 5 year program
- 2 Degrees (B.Ed & B.Sc)

**Speed...** shorter and few credits

**Flexibility...** can return to B.Sc in 4th year

**Depth...** learn about teaching mathematics and physics while being a student yourself

**Variety...** combine mathematics and physics courses with children

**Proven...** concurrent education is a good way to become a good teacher

### More Information:

[www.math.ubc.ca/Ugrad/education](http://www.math.ubc.ca/Ugrad/education)  
[www.phas.ubc.ca/education](http://www.phas.ubc.ca/education)

Applications to the dual degree program will be considered in the spring of your 2nd year.

An average of 65% is required to apply.

You must be ready to volunteer with children ages 13-18.

### Interested?

Contact Professor Chris Waltham at:  
[cew@phas.ubc.ca](mailto:cew@phas.ubc.ca)

**There is a shortage of Physics and Mathematics teachers throughout the entire NATION!**