

# PHYSICS & ASTRONOMY

## Outreach Program News

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Registration for our annual Phenomenal Physics Summer Camps is now open! Remember that registration is on a first come first served basis; in the past few years we have had many people on the waiting list, so register for a spot now. Looking for another option for grades 8-11 students? Check out the TechTrek computer science summer camp program put out by our partner (UBC Department of Computer Science). There are quite a few science competitions coming up, including the Michael Smith Challenge and the CAP High School Prize Exam on March 10, and the JPEC in May. And don't forget - Pacific Institute of Theoretical Physics organizes free public lectures every month. Read the newsletter for information regarding the two upcoming free lectures in March and April.

Thanks for reading and have a wonderful (and long-awaited) spring!

You can subscribe to our newsletter at our web site:

<http://outreach.phas.ubc.ca/emailList/index.php>

#### Contact Us

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## Upcoming Outreach Events

### 7th Annual Junior Physics and Engineering Competition - May 6th

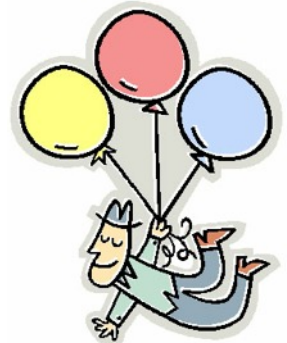
*A you-build-it competition designed for junior science students (grades 8-10) across BC.*

The **7th Annual Junior Physics & Engineering Competition** is being hosted at the University of British Columbia on **Friday, May 6th, 2011**. JPEC is a you-build-it competition designed for junior science students (grades 8-10) across BC. Its purpose is to build stuff, learn some physics, and have fun. It is run by volunteers, including high school teachers, students, and UBC faculty.

**Registration is free** - just email [mike\\_hengeveld@hotmail.com](mailto:mike_hengeveld@hotmail.com), or check out [http://www.junior\\_olympics.phas.ubc.ca](http://www.junior_olympics.phas.ubc.ca) for more information, including this year's pre-build events: Balloon Car Derby and Flying Egg Gun

**T-Shirt Design** - We are looking for submissions again for this year's t-shirt theme. Registration in JPEC is not a requirement so spread the word to your arty-folk. The deadline for submissions is **March 31st, 2011**. For more information, visit:

[http://www.junior\\_olympics.phas.ubc.ca/tshirt%20design.html](http://www.junior_olympics.phas.ubc.ca/tshirt%20design.html)



# Upcoming Outreach Events

## Phenomenal Physics Summer Camps - 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 2011 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://outreach.phas.ubc.ca/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 run three times: July 4-8, July 11-15, and July 25-29, 2011**

- *Have fun with...*building rockets, boats, and airplanes!
- *Learn about...*molecular structure of crystals, waves with musical instruments, and fluids with tornado tubes! The week includes daily outdoor games, 2 pool sessions, and a physics show with ice cream made from liquid nitrogen!

### Astronomy Camp (Grades 4-6) - \$250.00

**This camp will run twice: July 11-15, and July 25-29, 2011**

- *Let's explore our universe!* Build Martian habitats, view stars in a planetarium, and explore the properties of rockets.
  - *How does a telescope work?* Study and build your own 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 2 pool sessions, daily outdoor games and the physics show & ice cream party.

### Advanced Physics Camp (Grades 5-7) - \$250.00

**This camp will run twice: July 4-8, and July 18-22, 2011**

*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 2 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 run once: July 18-22, 2011**

- *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, learn about physics and the environment, and explore motion using motion detector probe technology.
- *Astronomy* - Build a planetarium, and experience weightlessness while **SCUBA DIVING!**

This week includes 2 pool sessions, outdoor games, lab visits, guest speakers and the fabulous physics show!



# Upcoming Outreach Events

## Upcoming PITP Public Lectures - March and April

*Interested in the fundamental questions about the nature of the physical world? Want to learn about topics in theoretical physics from world renown researchers?*

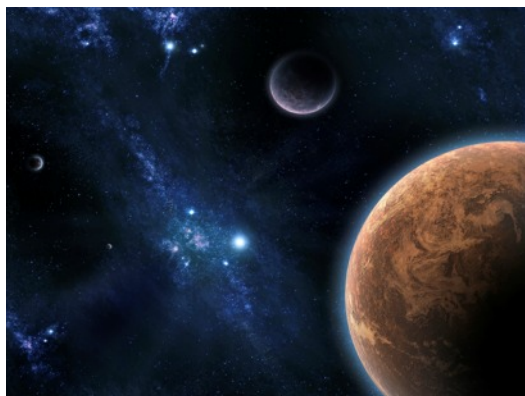
Pacific Institute of Theoretical Physics Public Lectures are intended for a broad audience. Some of lectures are exciting topics suitable for senior high school students interested in the fundamental theories behind interesting everyday subjects!



**LOCATION:** St. John's College ([2111 Lower Mall](#)) at UBC

**DATE & TIME:** Usually on the 2nd Wednesday of every month from October-April, at 7:30pm

### Mar 8, 2011: Other Earths and Other Life in the Universe by Dr. Geoff Marcy (Berkeley)



Science fiction taught us that our Milky Way Galaxy abounds with habitable planets populated by advanced civilizations engaged in interstellar commerce and conflict. Back in our real universe, Earth-like planets and alien life have proved elusive. Has science fiction led us astray? NASA recently launched a new space-borne telescope, Kepler, dedicated to discovering Earth-like worlds around other stars. The first results will arrive by March 2012 and will be described in this talk. Are any of these worlds suitable for life? What properties make a planet livable? How common is life in the universe, especially intelligent life? New telescopic and biological observations are providing the first answers to these questions. To learn more, visit his website: <http://astro.berkeley.edu/~gmarcy/>

### **NEW** April 13, 2011, 2011: Quantum Computing and Animal Navigation by Dr. Klaus Schulten (Urbana)



Quantum computing is all the rage nowadays. But this type of computing may have been discovered and used by living cells billion of years ago. Nowadays migratory birds use a protein, Cryptochrome, which absorbs weak blue light to produce two quantum-entangled electrons in the protein, which by monitoring the earth's magnetic field, allows birds to navigate even in bad weather and wind conditions. The lecture tells the story of this discovery, starting with chemical test tube experiments and ending in the demonstration that the navigational compass is in the eyes and can be affected by radio antennas. The story involves theoretical physicists who got their first paper rejected as "garbage", million dollar laser experiments by physical chemists to measure the entangled

electrons, and ornithologists who try to 'interrogate' the birds themselves. This work opens up the awesome possibility that room-temperature quantum mechanics may be crucial in many biological systems. To learn more, visit his website: <http://www.ks.uiuc.edu/~kschulte/>

Remember to bookmark the PITP lecture website for updates regarding upcoming talks:

[http://pitp.physics.ubc.ca/quant\\_lect/upcoming.html](http://pitp.physics.ubc.ca/quant_lect/upcoming.html)

To see what sort of lectures there have been in the past, visit the archives at:

[http://pitp.physics.ubc.ca/quant\\_lect/archives.html](http://pitp.physics.ubc.ca/quant_lect/archives.html)

For further information contact [pitpoffice@phas.ubc.ca](mailto:pitpoffice@phas.ubc.ca), or phone the PITP office at (604) 822-1383

# From Our Partner

## Computer Science TechTrek Summer Camp 2011

*Get, Set, Compute!*

Today computers fuel our world from keeping people connected via the latest social media trends to cutting edge technology, such as artificial intelligence. This summer, explore all that computer science has to offer at the University of British Columbia. Spend time in our top-notch facilities with computer experts who will take you through a week of adventure: learn programming languages like Java, tour our labs, design your own video game, solve exciting challenges with robots, prepare your own webpage, and a whole lot more! Oh yeah, and make some awesome friends. Learn why computer science has something for everyone!



This year we're adding even more summer camps, so you're sure to find a week that works with your summer plans!

Check out [www.techtrek.ca](http://www.techtrek.ca) for more information. Camps are for students in **grades 8-11**. Registration and specific camp information for summer 2011 will be posted by **March 10th**.

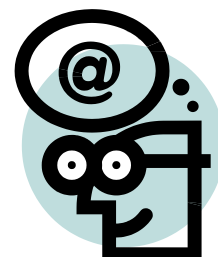
**(This camp program is organized by the Dept of Computer Science, University of British Columbia)**

# Competition Reminders

## Michael Smith Science Challenge (National) - March 10

*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 10, 2011

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

For more information or to register, visit: <http://SmithChallenge.ubc.ca> (English) or <http://ConcoursSmith.ubc.ca/> (French); contact [mschall@phas.ubc.ca](mailto:mschall@phas.ubc.ca) if you have any questions.

## CAP High School Prize Exam (National) - March 10



The Canadian Association of Physicists puts together a high school physics examination targeted for upper year physics students across Canada. It stresses logical and creative thinking, by asking questions going beyond the expectation of the classroom. Prizes are awarded to the top students both provincially and nationally.

The official writing day is **Thursday, March 10, 2011**. Top students can compete for a place on Canadian team which will participate in International Physics Olympiad in Thailand:

<http://www.ipho2011.org/>

Interested teachers and students should contact the provincial coordinator:

<http://www.cap.ca/en/activities/medals-and-awards/prizes-students/high-school-prize-exam/2011-hs-exam-coordinators>