

How to be a good graduate student?

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Outline

- Key advice.
- Good research practices.
- Staying on top of Literature.
 - Staying up-to-date
 - Managing your papers collection.
- Publishing your work.
- What I expect from my students

Key advice

- Choose a project that is interesting to you.
- Own your project.
- Being smart is not enough.
 - “Genius is 1% inspiration and 99% perspiration”
Thomas Edison
- Know what has been done in your field
- Think out of the box; be creative!
- Team work.
- Keep the big picture in front of you.

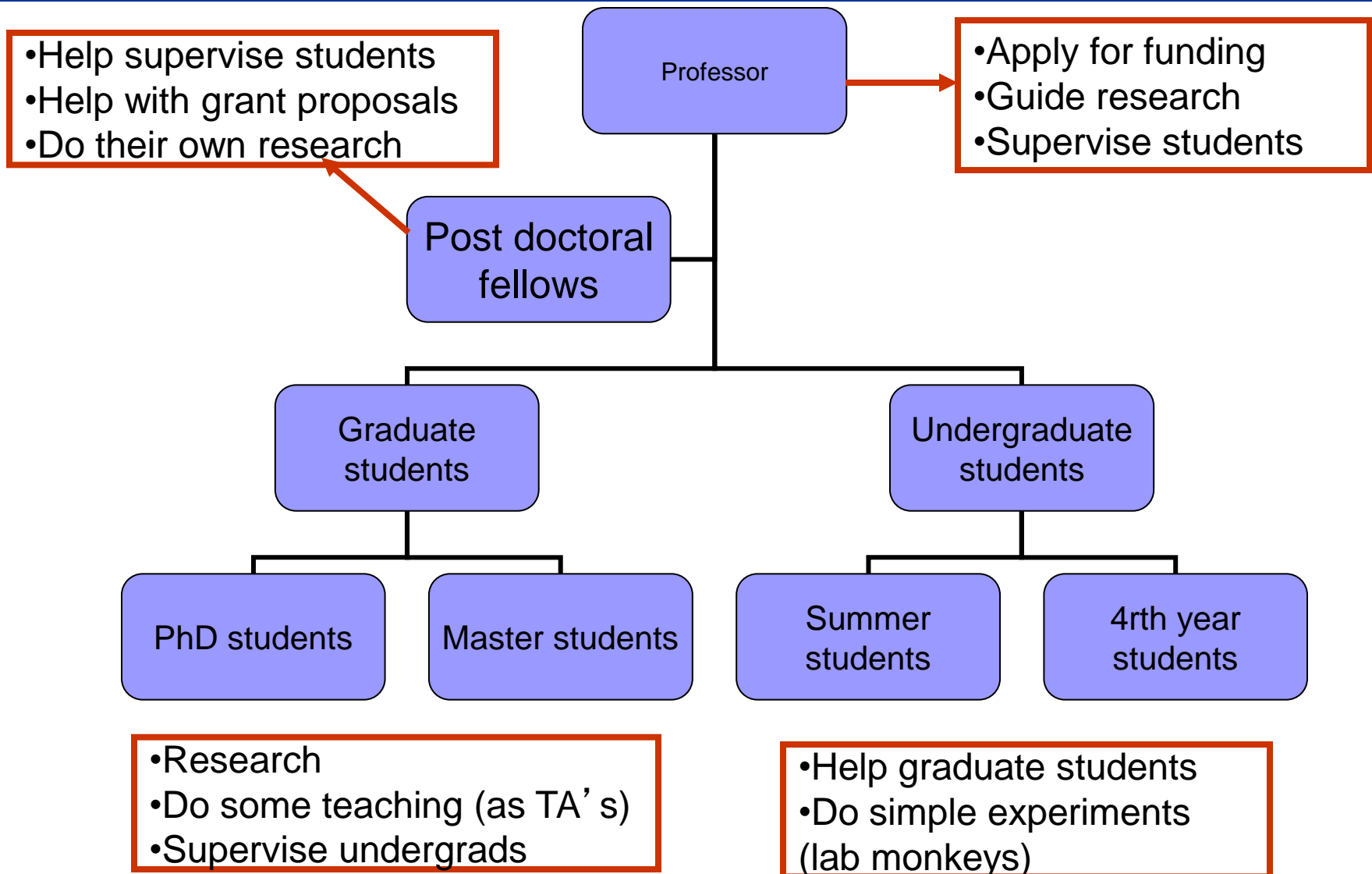




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Structure of research labs in North America





Good research practices-I

- **Work hard.**
 - Research is all about testing MANY parameters and finding the best combination.
- **Work on more than one project.**
 - Safer and more productive.
 - Supervise undergrads on side projects.
- **Keep a good lab notebook**
 - Write down your experiments or simulation results every day.
 - Helps keep track of your achievements and planning for future steps
 - Allow your work to be reproduced by others.
 - Protect your IP rights.
- **Regular meetings with your supervisor.**
 - Points you to available resources.
 - Keeps you on track.

Good research practices-II

■ Publish, Publish, Publish!

- Publications are the most important indicator of your performance as a researcher.
- Have a clear plan of possible publications as early as possible.

■ Expect hardship

- The path to success will not be without setbacks.
- Expect and accept criticism

■ Share your research with the world

- Talk about your projects with other researchers.
- Welcome opportunities to give seminars and presentations.
- Participate in conferences.

■ Give credit to those who deserve it.

■ Have fun! Life is all about balance.



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Staying on top of literature

- You can't make a contribution to the literature unless you know what is already there and what is missing.
- Probably many of the problems you are facing have faced others before.
- Learning what others are doing can give you ideas of new applications for your findings or help you improve them.

Subscribe to e-mail alerts

- Set popular databases (Science direct, IEEE explore, scopus) to send you notifications of new papers in your field once they are published.

Scopus: 3 More... (3) Web (81,979) Patents (21,562) Scholarsportal

Your query: TITLE-ABS-KEY(adaptive traffic signal control) AND RECENT(30) Edit Save Save as Alert RSS Search History

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- Proceedings of the 6th International Conference on Traffic and Transportation Studies Congress 2008 Traffic and Transportation Studies Congress 2008 ICTTS 2008 (1)

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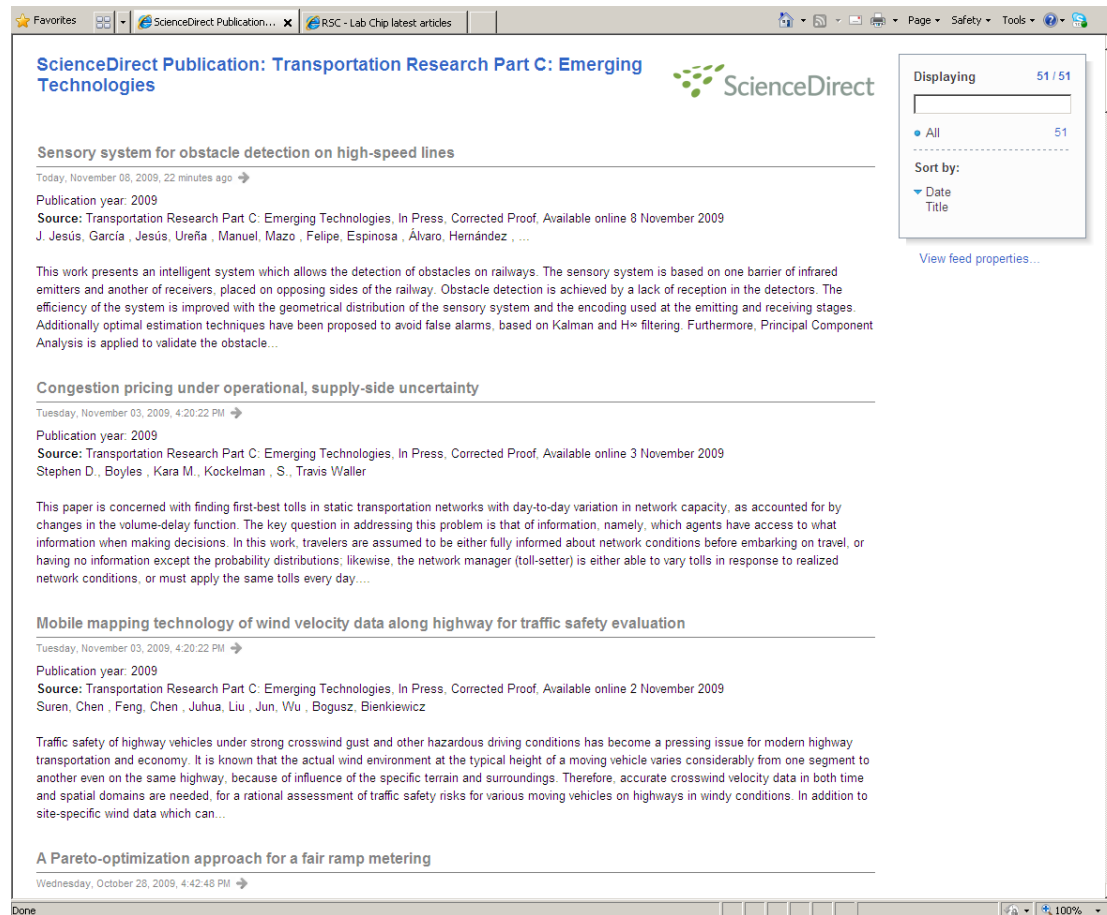
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Document (sort by relevance)	Author(s)	Date	Source Title	Cited By
1. <input type="checkbox"/> Adaptive fuzzy urban traffic flow control using a cooperative multi-agent system based on two stage fuzzy clustering Abstract + Refs SFX Show Abstract	Daneshfar, F. , RavanJamJah, J. , Mansoori, F. , Bevrani, H. , Azami, B.Z.	2009	IEEE Vehicular Technology Conference, art. no. 5073360	0
2. <input type="checkbox"/> The development of Taiwan arterial traffic-adaptive signal control system and its field test: A Taiwan experience Abstract + Refs SFX Full Text Show Abstract	Wu, Y.-T. , Ho, C.-H.	2009	Journal of Advanced Transportation 43 (4), pp. 455-480	0
3. <input type="checkbox"/> Bus priority option tests in microsimulation with SCATS Abstract + Refs SFX Show Abstract	Xiang, M. , Hardcastle, S.	2008	Proceedings of the 6th International Conference on Traffic and Transportation Studies Congress 2008: Traffic and Transportation Studies Congress 2008, ICTTS 2008 322, pp. 540-552	0

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The screenshot shows a web browser window displaying a ScienceDirect journal alert page. The page title is "ScienceDirect Publication: Transportation Research Part C: Emerging Technologies". The ScienceDirect logo is visible in the top right corner. The page displays a list of articles, each with a title, date, and abstract. The first article is "Sensory system for obstacle detection on high-speed lines", published on November 08, 2009. The second article is "Congestion pricing under operational, supply-side uncertainty", published on Tuesday, November 03, 2009. The third article is "Mobile mapping technology of wind velocity data along highway for traffic safety evaluation", published on Tuesday, November 03, 2009. The fourth article is "A Pareto-optimization approach for a fair ramp metering", published on Wednesday, October 28, 2009. A sidebar on the right shows "Displaying 51 / 51" and "Sort by: Date".

ScienceDirect Publication: Transportation Research Part C: Emerging Technologies

Sensory system for obstacle detection on high-speed lines
Today, November 08, 2009, 22 minutes ago →
Publication year: 2009
Source: Transportation Research Part C: Emerging Technologies, In Press, Corrected Proof, Available online 8 November 2009
J. Jesús, García, Jesús, Ureña, Manuel, Mazo, Felipe, Espinosa, Álvaro, Hernández, ...

This work presents an intelligent system which allows the detection of obstacles on railways. The sensory system is based on one barrier of infrared emitters and another of receivers, placed on opposing sides of the railway. Obstacle detection is achieved by a lack of reception in the detectors. The efficiency of the system is improved with the geometrical distribution of the sensory system and the encoding used at the emitting and receiving stages. Additionally optimal estimation techniques have been proposed to avoid false alarms, based on Kalman and H[∞] filtering. Furthermore, Principal Component Analysis is applied to validate the obstacle...

Congestion pricing under operational, supply-side uncertainty
Tuesday, November 03, 2009, 4:20:22 PM →
Publication year: 2009
Source: Transportation Research Part C: Emerging Technologies, In Press, Corrected Proof, Available online 3 November 2009
Stephen D., Boyles, Kara M., Kockelman, S., Travis Waller

This paper is concerned with finding first-best tolls in static transportation networks with day-to-day variation in network capacity, as accounted for by changes in the volume-delay function. The key question in addressing this problem is that of information, namely, which agents have access to what information when making decisions. In this work, travelers are assumed to be either fully informed about network conditions before embarking on travel, or having no information except the probability distributions; likewise, the network manager (toll-setter) is either able to vary tolls in response to realized network conditions, or must apply the same tolls every day....

Mobile mapping technology of wind velocity data along highway for traffic safety evaluation
Tuesday, November 03, 2009, 4:20:22 PM →
Publication year: 2009
Source: Transportation Research Part C: Emerging Technologies, In Press, Corrected Proof, Available online 2 November 2009
Suren, Chen, Feng, Chen, Juhua, Liu, Jun, Wu, Bogusz, Bienkiewicz

Traffic safety of highway vehicles under strong crosswind gust and other hazardous driving conditions has become a pressing issue for modern highway transportation and economy. It is known that the actual wind environment at the typical height of a moving vehicle varies considerably from one segment to another even on the same highway, because of influence of the specific terrain and surroundings. Therefore, accurate crosswind velocity data in both time and spatial domains are needed, for a rational assessment of traffic safety risks for various moving vehicles on highways in windy conditions. In addition to site-specific wind data which can...

A Pareto-optimization approach for a fair ramp metering
Wednesday, October 28, 2009, 4:42:48 PM →



How to read a paper in 5 minutes?

1. Read the title and abstract
2. Look at the figures and read their captions.
3. Read the conclusion
4. Check the methods or results section for more info, if you need any.



Check websites of other universities

- Learn about their research projects and publications before they appear.
- Some data (videos, presentations, posters) are only available on the group website.
- Search for theses of the lab alumni.
- Examples:
 - [Aaron Wheeler group at University of Toronto.](#)
 - [Paul Yager group at Washington University.](#)
 - [Milica Radisic group at University of Toronto.](#)



Attend conferences

■ Arrive prepared:

- Choose presentations you want to attend.
- Decide whom you want to meet.
- Prepare 1 min talk about your research.
- Prepare many business cards.

■ At the conference:

- Use every chance to talk to other researchers about their work and yours.
- Get advice from senior researchers about new directions developing in your field.
- Share your knowledge of the literature with others (exchange papers, websites..etc)

■ After the conference:

- Summarize what you saw and learned (better in the form of a presentation to your lab mates who didn't attend)



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Use bibliography software

- Serve two purposes:
 - Manage your database of papers effectively
 - Make writing reference lists for your manuscripts or thesis a lot easier.
- Examples: EndNote, Procite, Refworks.
- Free software: Mendley
- Basic functions:
 - Importing references
 - Insert PDF files, figures, and research notes.
 - Format reference lists
 - Change and edit styles





Examples

EndNote

Mendeley



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- **Publishing your work.**
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Publishing your work

- Number and quality of publications is the most important measure of your performance as a graduate student.
- Even more important than your thesis.
- Your publication record will affect:
 - Awards and scholarships you get
 - How easy your thesis defense will be
 - Future graduate studies
 - Your career



Publishing your results

Advice by George Whitesides:

- ‘Interesting and unpublished’ is equivalent to ‘non-existent’
- Start writing papers outlines early in a project. Do not wait until the ‘end’ . The end may never come.
- Generate only the data that supports your outline.
- Shorter papers are easier to read than longer ones.
- The ingredients of a good manuscript are:
 - Novelty of research topic
 - Comprehensive coverage of the literature
 - Good data and good analysis
 - A thought provoking discussion



Journal Impact Factor (IF)

- A journal IF in any year is the average number of citations in that year given to the papers published in that journal in the two preceding years.
- IF for Journal of Fluid Mechanics:
 - 501 papers in 2007 and 487 papers in 2006
 - Total number of citations for these papers in 2008 was 2287
 - IF in 2008 is $2287/(501+487)=2.315$



Impact Factor-II

- Highest IF is 74.5 for Cancer Journal for Clinicians
- Out of 6500 journals on ISI, only 116 has an IF above 10.
- Engineering journals have much lower impact factors (<2) than science journals.
- Is the IF a fair parameter:
 - Self citations?
 - Review journals?



Increase your research visibility

1. Publish in high IF journals.
 - Cited more frequently.
 - Have connections to the media.
2. Maintain a descent well-updated webpage.
3. Post your papers on your homepage.
4. Present at conferences
5. Publish in open access journals.
(www.doaj.org)



How to assess your research impact?

- The number of citations your papers get.
- Average citation per paper.
- Your individual impact factor.
- *Your h-index:*
 - *h*-index of 4 = you have 4 papers cited more than 4 times each.
 - *h*-index of 6 = you have 6 papers cited more than 6 times each
 - Ahmad Zweil *h*-index is 45



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What I expect from my students-I

- Consider me as a friend before being a supervisor.
- Work Hard
- Group meetings at least once every two weeks.
- Individual meetings at least once every two weeks.
- Have regular access to a computer and the internet.
- Check your e-mails regularly
- Learn how to search scientific databases and create e-mail alerts.
- Subscribe to table of contents alerts of relevant journals.
- Learn how to use Endnote.

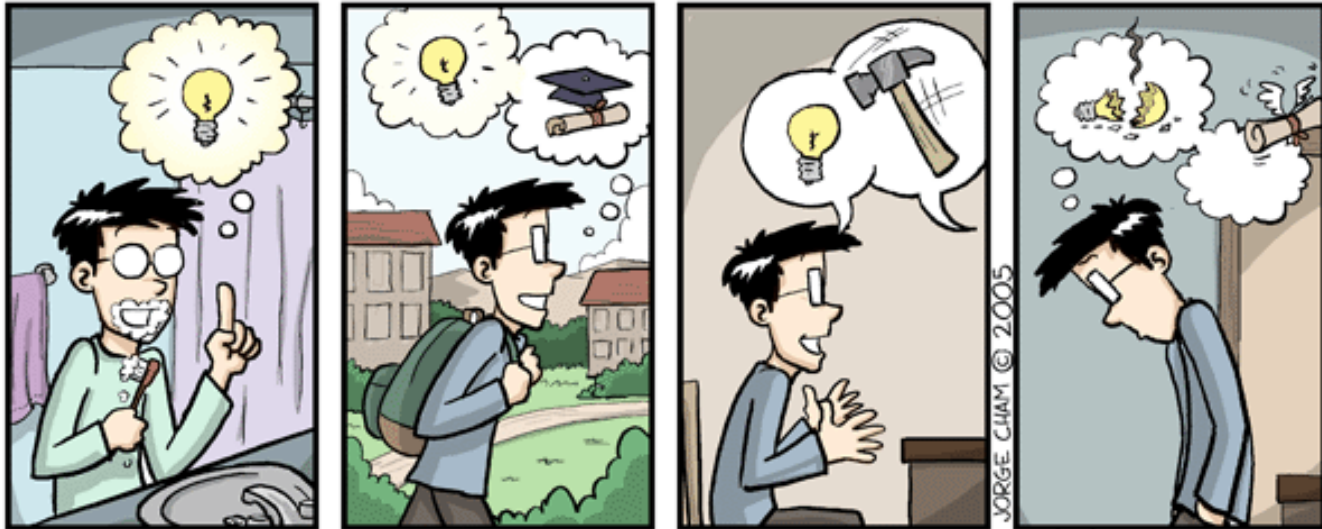


What I expect from my students-II

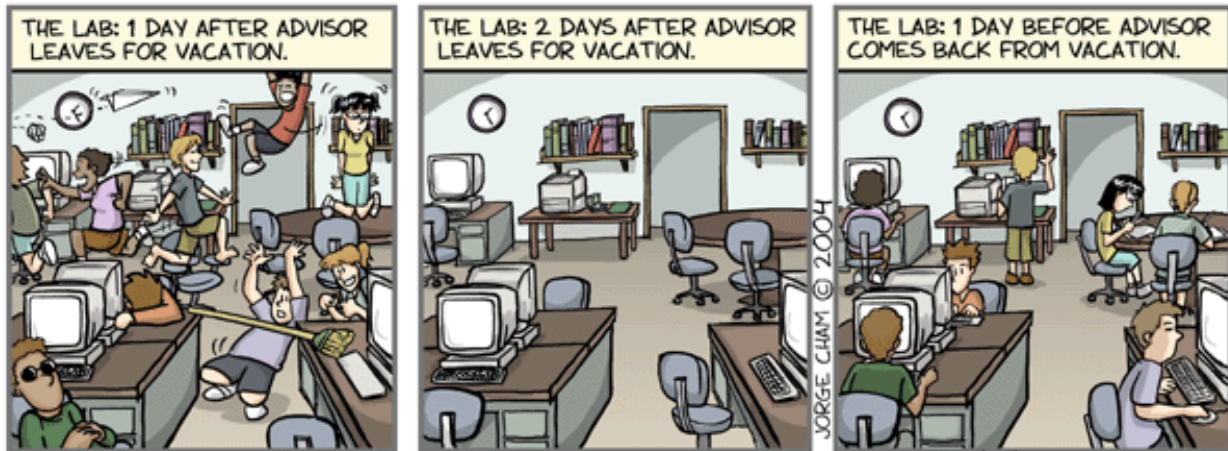
- Learn how to use Microsoft Word and Powerpoint properly.
- Start enhancing your English language skills (e.g. Take courses). I will help.
- Teach new students who join the group.

Recommended:

- Have your own computer.
- Subscribe to Phdcomics.com 😊



SUMMER DAYS...





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http://www.hhmi.org/resources/labmanagement/mtrmoves_download.html

Acknowledgement

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Thanks for your attention