The Project:
Our project involved teaching middle and high school level students a variety of subjects, but mostly math and science. The two schools we taught at were very different.

At Parikrma, we formulated lessons and projects for the 11th grade class. Our focus was on interactive sessions developing critical thinking skills, as well as computer-based learning.

At the Shri Ram School, we taught everything from 6th grade Math to IB Physics to Theatre and History. We also connected the school with the OpenCourseWare Project as a mirror site.

Preparation:
We were required to take 21F.040: A Passage to India: Introduction to Modern Indian Culture and Society in which we watched movies, read books and articles, and discussed Indian history and current issues.

We also talked to other students who had been to India before to get a better idea of what we needed to bring and what it would be like.

We attended at least six of the MIT-India preparation sessions, which were really valuable.

Finally, we interacted with the schools we would be teaching at to better understand their expectations and what we could prepare before we arrived.

Life in Sahakara Nagar:
We were provided a basic apartment - empty rooms with three (bug-ridden) mats on the ground and a bathroom. There were no other westerners in the town, and slums intermixed with houses.

We walked to school through a construction zone, bought our water from a corner store, and walked ~45 min to a restaurant for dinner each night. Sometimes we would go to an internet café before dinner.

On the weekends we adventured into Bangalore to shop or dine or see the sights, and one weekend we traveled to Mysore.

Life in Gurgaon:
While we were teaching at the Shri Ram School, we stayed at their guest house. At the other extreme of our Sahakara Nagar housing, we had beds, air conditioning, hot water, showers, clean water, wireless internet, and a staff of people to clean and cook our meals.

Though the accommodations were incredible, we could not leave the house, as it was not safe to walk anywhere and did not have access to autorickshaws. We were picked up in the morning and taken to school, and were driven home after school. If we wanted to go anywhere, we had to hire an expensive taxi.

Impact and Back at MIT:
Participating in MISTI has had a big impact on all three of us. Not only did we make connections with amazing people who we keep in touch with, we also discovered dedicated non-profits that are doing amazing things for children and India. We have continued to stay involved, and hope to contribute more significantly in the future.

Our time in India also gave us valuable cultural context which has helped us in our daily interactions back in the US. From learning local customs to picking up some Hindi, we learned much more than we taught!
The Project:

There are many locations, including the American Southwest, where high quality solar and geothermal resources coexist.

The goal of the project was to analyze the addition of solar energy to a binary cycle geothermal plant in Stillwater, NV.

Candidate hybrid cases were identified and modeled using Aspen.

Utilization efficiency, net power, and cost were calculated and used as criteria for selecting the most promising configurations.

Impact:

I completed a novel engineering project with one of the top companies in the renewable-energy sector...

...while discovering the beauty of my Italian heritage.

The Host:

Founded December, 1962.

Italy’s largest power company and Europe’s second listed utility by installed capacity.

83,300 employees.

Present in 22 countries with approximately 94,300 MW of generating capacity.

Committed to the development of renewable resources with 19,000 MW installed capacity and continued experimentation and expansion.

Preparation:

I had substantial research experience working as a UROP every term starting from my first summer, when I completed a project that ultimately lead to a first-author publication and a start-up company.

Two valuable classes for my internship were Sustainable Energy and Fundamentals of Advanced Energy Conversion.

Serenella Sferza and the MISTI cultural training adequately prepared me for living in Italy.

Life in Pisa:

Located in the region of Tuscany.

Mid-size town.

3 important universities.

Ideally situated (only 20 minutes from the beautiful beaches of the Versilia coast and 1 hour away from Florence).

Back at MIT:

When I returned to MIT, I continued working on the project with Professor Tester and a team of engineers. We’ve written a formal report in a collaboration with ENEL. While working with one of the world’s leading geothermal experts, I’ve excelled at energy process design and learned fundamental engineering analysis techniques. I will continue to work in the energy sector by pursuing a Ph.D. in Mechanical Engineering at MIT.

I continue to improve my Italian language skills with classes and practice with friends. Since my MISTI internship, I’ve embraced my Italian heritage, identifying as an Italian-American. This summer, I have the opportunity to return to ENEL for another internship.

Green Italy in MA 10/7/08

La Luminaria: the celebration of San Ranieri with candles along the Arno River.
The Project:
Transit systems are difficult to build, but even MORE DIFFICULT to operate. Measuring performance helps to:
(a) Improve service quality
(b) Address problems before they become serious
(c) Regulate operators/concession

Created a performance measurement system for Metrobus, which included:
- Manual compiling the state-of-the-practice for this type of system (BRT)
- Process mapping of existing practice
- 4 Phase Implementation Plan
- Development of Phase I: Demo Software (Visual Basic) + Sample Data Collection

Impact:
The performance measurement system was in its 3rd phase of development 6 months later; a web-based application was being developed for everyday use.

While in Mexico, key problems with the operation were identified through Sample Data Collection and Demo Measurement Tool.

Through this project I applied many of the ideas learned in the classroom... and realized how different rehearsal is from a live concert with BIG and important consequences.

In addition, the internship got me connected with some of the key actors shaping Latin America’s urban transport future.

The Host:
The Center for Sustainable Transport (CTS) was established in Mexico in 2002 as part of the EMBARQ-WRI network.

Guides the design and implementation of Mexico City’s BRT System from 2003 to 2005 when it began operations.

Taken a leading role in developing sustainable transport solutions throughout the country, including Clean Diesel retrofitting programs, Bicycle promotion, Carbon Emissions Trading, and Transport Oriented Development projects.

Recently (March 2009) helped Macrobus, Guadalajara’s BRT System, initiate operations successfully.

Preparation:
My experience as part of the Transportation program at MIT were the main contributor to my ability to perform.

This includes a summer internship at the London Underground, as well as a problem-solving process acquired during arduous weeks of research.

Having friends from Mexico was a huge asset when it came down to “blending” in and understanding the psyche of the place – especially in the work environment where sensitivities run high.

Life in Mexico City:
• Tacos al Pastor y Campechano, Tlacoyos (sp?)
• Weekend In Acapulco
• Piramides de Teotihuacan
• Indios Verdes @ 5:00am
• Pumas y la UNAM!!!!!!!!!!!
• Night LIFE!
• Museum of Anthropology (wow)
• Bosques de Chapultepec
• Frida Kahlo & Leon Trotsky

Back at MIT:
It was hard coming back... but... I got so much more out of my last year in my program after this experience, knowing what classes to focus on, what areas I needed to re-inforce, and where I should be aiming once I graduated.

Not to mention, I gained an appreciation for all the wonderful things I did have at MIT... the stimulating fast-paced push-me-to-my-very-best-almost-at-the-verge-of-crying sense of accomplishment and growth you won’t find anywhere else. I ESPECIALLY missed my good friends here, which you hardly notice until you/they graduate.
Dina Poteau  
Junior Environmental Engineering  
Internship at Technion University  
Haifa, Israel  
Imaging Research for Environmental Monitoring

The Project:

The internship project dealt with agricultural monitoring techniques using hyperspectral images. The objective was to find whether there was a specific wavelength or texture parameter that would allow us to detect stress in plants in pictures. This would provide the ability to remotely detect problems without direct interaction with the plants.

I got hands-on experience with state-of-the-art imaging equipment and data analysis methods. We experimented with cucumber and tomato plants using special cameras that allowed us to isolate certain wavelengths of light in the pictures.

Impact:

Project Results:
Through the data analysis of the pictures we identified possible texture parameter for remotely looking at plant pictures. These primarily findings provide a starting point for further investigation of looking at texture for image analysis of agricultural plants.

Personal Impact:
Personally, the internship was a unique cross-cultural experience and I had the opportunity to learn more about imaging analysis and agricultural research. I also enjoyed working on an agricultural project that could potentially optimize food harvesting.

Life in Haifa:

Haifa was a great city to live in. I explored marketplaces in the Hadar District and visited sites like the “Cave of Elijah” (site linked to a Hebrew prophet). It was also nice to stop by the many bakeries around the city for fresh pita bread.

During my excursions, I found a lot of people wanted to meet and converse with me because of English. Many Israelis were interested in meeting with an American, finding out just why I decided to spend the summer in Israel, what I thought of the country and practice their English a bit. People wanted to learn about me just as much as I wanted to learn from them.

The Host:

Technion University or the Israel Institute of Technology is an acclaimed engineering and science university in Haifa, Israel. I worked with a professor in the Faculty of Civil and Environmental Engineering. His research focused on modeling and optimization of environmental systems.

I had the opportunity to live on campus in student housing. I was convenient to live near the lab I was working in. School was in session for the duration of my internship so it also provided me the opportunity to experience campus life and meet Israeli students.

Preparation:

17.911 - Israel: History, Politics, Culture, and Identity
I took a seminar during spring semester that gave me an overview of Israeli culture and politics.

MISTI cultural training:
We received practical information on living in Israel. Israeli students in MIT and Cambridge also offered us advice on good places to eat and hang out in Haifa.

Back at MIT:

I really enjoyed my summer aboard and I’m considering participating in the MISTI Italy program next summer.
Farah Khan
’09, Environmental Engineering
Liz Theurer
’09, Mechanical Engineering
Olinda Hassan
’09, Political Science, Wellesley

The Project:
Research interns with Global Infrasys/Asia Consulting Group
Energy consulting research including:
• Country profiles
• Global energy and power deregulation database

The Host:
Worked with Global Infrasys/Asia Consulting Group
Energy and power consulting company based in Gurgaon, India

Impact:
Learned how to work cohesively with a group of people from completely different backgrounds
Helped our coworkers see a different style of working and learning
Made a significant contribution to the growing research

Life in New Delhi and Gurgaon:
• We all lived in a flat in a middle class New Delhi neighborhood
• The commute to Gurgaon took around 1 to 2 hours each way
• We loved exploring New Delhi during our time outside of work

Back at MIT:
• Working in India enabled us to gain a greater appreciation for life in the U.S.
• We brought back a newfound understanding of how to work cohesively with people from all different backgrounds
• We also learned how to use various new computer programs
• All of us greatly value our overall MISTI experience
The Project: HiTo: An Advanced Mortgage Meltdown Prevention System (A.M.M.P.S.)

Impact:
The project gave me the chance to lead my own project in a field that I was concerned would not be a very interesting one; I learned that I do my very best work with minimal supervision and maximum freedom. This realization has directly impacted my decision not to enter industry following graduation.

The work I performed will be expanded upon by members of my team, and may eventually impact Mexican financial policy — but I doubt it.

Preparation:
The best way I prepared was through language training: Being able to communicate fluently with the locals was a tremendous asset. Having participated in MISTI-China the year before also helped in preparing me to expect the unexpected.

Beyond that, I would advise interns not to worry too much about preparing, especially for things beyond their control. Go with an open mind, say “yes” to all invitations — both from your coworkers and from your peers — and don’t look back on any decisions you make.

Life in Mexico City:
Mexico City is an enormous metropolis and the amount of time spent there for any internship will be insufficient to explore its intricacies.

The main sights in Mexico City should be experienced, but Mexico offers many interesting locales beyond the D.F. that can be visited on the weekends.

Rumors of kidnappings, muggings, drive-by shootings, drug busts are slightly exaggerated; Mexico City is no more dangerous than you allow it to be. Look like you know what you’re doing at all times and try to limit your gringo accent.

Back at MIT:
My experiences in Mexico this past summer and in China the summer before have solidified my desire to choose a global career. I have developed a newfound appreciation for my major, and I have discovered that I enjoy tackling issues that are cross-cultural in nature.

Beyond this, the language skills I picked up and the friendships I made will remain with me well into the future, beyond my days at MIT.
Aleem’s Project:

Few-cycle-laser sources have a wide range of important applications including attosecond science, spectroscopy, and frequency metrology.

Optical parametric amplifiers (OPAs) allow us to generate few-cycle sources in a range of wavelength regions from a fixed center-wavelength pump thanks to their tuning properties and wide gain bandwidths.

We developed a novel, 2-stage OPA that produces few-cycle, high energy, and CEP phase-stable pulses that span the important wavelength range around 800nm.

The Host:

Politecnico di Milano was founded in 1863. Headed by Rector Giulio Ballio. Ranked as an outstanding European university in Engineering, Architecture and Industrial Design. With more than 40,000 students, it is the largest institution in Italy for Engineering. Participates in many research and training projects which span multiple European universities and institutions.

Preparation:

We prepared for the study abroad experience by taking six weeks of beginning level Italian at a local school. We also made sure we understood the documentation process so it would go smoothly.

By meeting with the program coordinator, Dr. Serenella Sferza, speaking with professors and students in Milan, and reading as much as possible about Italian culture, we were well prepared when we arrived.

Impact:

Aleem’s experience provided him with training with a world renown group in the field, and allowed him to gain perspective on managing a complex project.

Back at MIT:

Yu is now preparing a PhD thesis proposal which involves completion of her research under the supervision of the PIs she worked with at the Politecnico. She plans to return to Milan in June 2009.

Aleem is now pushing to complete his PhD project incorporating many of the techniques he learned from the Italian group.

Life in Milan:

The second largest city in Italy, Milan is famous as a fashion capital and for its commercial activity. With a population of about 1.3 million people, it is surprisingly diverse, with largest minority groups being Egyptians, Chinese, and South Americans.

With a rich history and culture, Milan is an exciting place to explore. Milan’s convenient public transportation and central location makes it an ideal place to visit other famous Italian cities and neighboring countries.

Yu’s Project:

Lab-on-chip (LOC) technology is the miniaturization of the traditional biochemical laboratory using microfluidics.

LOC’s have the advantage of using small sample volume, can be compact and portable, and enable high-throughput processes.

The integration of LOC with laser-written waveguides enables optical sensing of bio-agents or bioreactions.

Femtosecond laser writing of waveguides integrated with LOC does not affect existing microfluidics and enables customizable 3-D fabrication.
Ian Rousseau
Junior, Physics

Internship at OSRAM Opto Semiconductors
Regensburg, Germany

Computer simulations for energy-efficient organic light-emitting diode (OLED) lighting

The OSRAM interns (l to r): Hadi Zaklouta, Nicole Berdy, myself, and Bill Near

The Project:

Organic light-emitting diode (OLED) technology could improve lighting and displays. OLEDs promise to be more energy-efficient, colorful, and cheaper than current technology.

Limited lifetime has kept OLEDs from becoming commonplace.

Understanding what’s going on inside the OLEDs is the key to improvements. I worked on a computer simulation to help OSRAM figure out the internal physics of their OLEDs.

Hopefully, this program will help OSRAM solve the lifetime problem and be first to market with OLED lighting.

Preparation:

UROP
2 years working in organic electronics in Prof. Bulovic’s group, the Laboratory for Organic Optoelectronics. Simulation and hands-on experience.

Language classes
German I (IAP)
German II

+ MISTI cultural training

Life in Regensburg:

Regensburg is a medieval city of about 100,000 in Bavaria, about ninety minutes north of Munich on the Danube river (right). The narrow, cobbled streets of the Altstadt, 12th century bridge, and 700 year-old cathedral make Regensburg a UNESCO world heritage site.

I lived in a 7-person Wohngemeinschaft about fifteen minutes from downtown. My roommates (left) introduced me to their friends and made me feel at home. I enjoyed watching the European Soccer Championship, going to see my roommate’s band perform, visiting local swimming holes, and camping out in the Bavarian forest.

Impact:

Academics
Switched majors from electrical engineering to physics
HASS Concentration in German

Research
Applied knowledge from this summer to create computer simulations for my UROP

Personal
Took a two week cycling trip from the Cinque Terre in Italy through Switzerland back to Germany

Outlook
Experienced many different cultures and viewpoints.
Visited amazing and beautiful places

Back at MIT...

Academics
Finishing up Course 8 and German concentration

Personal
Racing with the MIT cycling team

Next summer
MISTI-France internship in Grenoble with the CEA, a French government research agency. Computer simulations of metal oxide semiconductors.

After graduation...
Who knows? I’d like to eventually go to graduate school and would consider studying in Europe.

OSRAM:

OSRAM Opto Semiconductors GmbH was spun-off from Siemens in 1999. They specialize in solid-state lighting technology.

You can find OSRAM’s products in:
• Automobile interior lighting
• Blue-ray players
• Cellphones with projectors
• Niche custom lighting installations

OSRAM:

OSRAM:

Preparation:

UROP
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Internship at GMV Madrid, Spain

Collect information about developments in bio-inspired autonomous navigation technologies and create a prototype to test algorithms

The Project:

- Review research about bio-inspired autonomous navigation technologies in US and other English-speaking universities
- Create a summary of the advances in the technologies and how it had been applied so far
- Model a prototype of a lighter-than-air vehicle in SolidWorks to be used to test algorithms by GMV
- Build the lighter-than-air prototype

The Host:

GMV was a great place to work!

The people were all very friendly and I felt like I could ask anyone questions. I was able to discuss the project with my boss and I had lots of input in what my role in the project was going to be. Many of the employees there were very flexible and willing to listen and help me with any concerns or problems.

GMV employs people from places all over Europe. It was really nice to see many different cultures in the workplace and to get to know people from all over. The people were also really helpful in giving me advice about traveling and living in Madrid or Europe in general.

Impact:

I have always wanted to be bilingual and living in Spain for the summer really helped to improve my Spanish skills. Living in Spain has given me the confidence to take advantage of other abroad opportunities at MIT.

The experience showed me that I could be successful in any new and challenging environment which helped me to feel more confident professionally. I feel that I am prepared to go anywhere life may take me and be successful in any situation.

Preparation:

I took 3 classes (21F.703, 704, and .711) before I went to Madrid for the summer. They were really helpful because I was able to practice speaking and writing in Spanish before going to Spain. It was also great to get feedback from my professors so I was able to improve my skills.

The European MISTI retreat before the summer was also helpful. It allowed me to meet other interns and exchange contact information. This made it easy to travel and contact other MIT students in Europe which made the experience even more enjoyable!

Life in Madrid:

Madrid is a wonderful place to spend a summer. I spent lots of afternoons wandering around the city taking in the beauty and the culture. The people were all very friendly and willing to help if I needed it. The city is full of great attractions from churches and parks to museums. Some of my favorite places were El Parque del Retiro and El Museo Reina Sofia which houses Picasso’s “Guernica”. Madrid also has an amazing nightlife! There was never a dull moment from watching the EuroCopa Finals in Plaza Colon to dancing the night away in one of the many clubs or hanging out with friends in the park. The food in Madrid is also amazing. It was great to try all the different kinds of tapas and jamón with some delicious sangria.

Back at MIT:

Since being back at MIT, I have continued with my Spanish classes and am enjoying them more than ever. I also participated in an abroad opportunity with MISTI Mexico over IAP 2009 working at Casa Telmex. I would love to have other opportunities with MISTI during my time at MIT because I absolutely loved my time in Spain. I have applied to a few companies in Mexico for next summer and I look forward to hearing back from them. I hope that at some point I will be able to work abroad in a Spanish-speaking country after graduation. I’m really grateful for the opportunity I had with MISTI Spain because I feel that it helped me to become more confident professionally and has encouraged me to take more risks and truly experience life.
Internship at Bayer Technology Services
Leverkusen, Germany

Characterizing Uvivatec®, an innovative technology for improving viral safety in pharmaceutical processes and products

The Project:

In summer 2008, Nahathai characterized inactivation kinetics, functions in recirculation mode, and residence time distribution at different flow rates and viscosities of the Uvivatec®, an innovative technology for improving viral safety in pharmaceutical processes and products. With this technology developed by Bayer Technology Services, viruses are inactivated in biopharmaceuticals (i.e. cell culture media, antibody solutions, recombinant proteins, therapeutics) by UVC irradiation and a special flow routing to allow biological fluids to be rendered germ-free without critical protein losses.

Impact:

From the internship experience, Nahathai was able to apply her engineering skills in an international setting and gained insights on interactions between customers and the firm.

The Host:

Bayer Technology Services GmbH (BTS) is a subgroup of Bayer AG, a German chemical and pharmaceutical company headquartered in Leverkusen, Germany and present worldwide. BTS offers fully-integrated solutions along the life cycle of chemical and pharmaceutical plants - from development through engineering and construction to process optimization for existing plants.

An example of BTS’ competence spectrum is Uvivatec®, a scalable and marketable innovation for highly efficient inactivation of small non-enveloped viruses with the level of clearance efficiency that other methods are not able to attain.

Preparation:

Prior to her internship, Nahathai had research experience in biology and took chemical engineering classes that provided her with knowledge and understanding of her internship project.

Bayer Technology Services was able to use Nahathai’s results to tackle customers’ inquiries. At the end of the internship, Nahathai was able to connect her MIT advisor and her BTS supervisor for a potential research collaboration between MIT and Bayer.

Back at MIT:

After seeing interdisciplinary work in a corporate during her internship at BTS, Nahathai decided to add a minor in Management to her study. She also continued learning German language.

In January 2009, Nahathai went back to Germany to research potential international development projects for further collaboration between MIT and University Duisburg-Essen and explored fundraising/advertising campaigns.

She will also go back to Germany this summer, where she will work on the production of micro-algae using power plant flue gases to bind carbon dioxide at RWE Power.
Praveen Subramani
Junior
Electrical Engineering

The Project:
During my summer in Granada, I worked to design and construct a set of hardware prototypes of infrared tracking devices. The goal of my project was to design a product that would facilitate technology and computer access by disabled and elderly patients (such as arthritis patients) who cannot use traditional input devices such as mice and keyboards due to physical limitations.

After extensive design, research, collaborative case studies with medical professionals and other engineers, I constructed the prototypes which in conjunction with software formed a fully functional system that allowed complete control over a computer from meters away through a wireless tracking and sensing system.

The Host:
La Fundación Telefónica, through its research and development arm Telefónica Investigación y Desarrollo (TID) is the research and development arm of Spain's largest telecommunications company. The Granada center focused on the application of telecommunications products and infrastructure to e-Health applications such as remote surgery, home rehabilitation projects, assistive living systems, and ambient sensing.

The Granada office contained about 35 software and telecommunications specialists divided between two facilities, a research and development center and a professional demo center.

Impact:
Throughout the summer, I gained invaluable work and cultural experience through my experiences at TID. As an electrical engineer working at a facility of mainly software and telecom specialists, I had the unique opportunity to work in a highly collaborative and truly international environment. I was privileged to have interactions with many talented engineers and together we succeeded in creating effective hardware prototypes for their remote rehabilitation projects.

Preparation:
Academically, I had prepared for my internship abroad with two UROP projects at the Media Lab, an internship at UCSD the previous summer, and several introductory EECS classes. Much of the workplace dynamics and the day to day interaction with international colleagues and supervisors requires great flexibility and sometimes even a good sense of humor... make sure to keep an open mind!

Culturally, I prepared for my summer in Spain with Spanish I-IV at MIT (4 semesters). MISTI Spain training sessions and the MISTI European Retreat also provided valuable exposure to Spanish culture and introduction to some Spanish traditions and perspectives before the head on plunge into the dynamic and energetic lifestyle of Spain.

Life in Granada:
Granada, the last Moorish capital of Spain, is one of the country's most spectacular and mysterious cities. Home to the splendid Alhambra fortress/palace, Granada pulses with a unique fusion of Spanish and Arabic culture. Scents of succulent roasting lamb and sweet aromas of Moroccan mint tea and honeyed Arabic pastries float through the air in Granada’s Albayzin, the old Moorish district. The caves in the Sacromonte district of the city are regarded as the birthplace of flamenco, and talented flamenco musicians and dancers of all ages can be found in plazas and lookout points around Granada, their music growing livelier as the night goes on.

Back at MIT:
I returned from my summer in Spain with vastly improved Spanish fluency, experience with working in a professional environment outside academia, and countless memories and friendships. Back at MIT, I have applied the experience I gained designing infrared devices for several of my engineering classes and a UROP project at the Media Lab.

Visiting and exploring the cities of Spain and other European countries was so fascinating that I am now pursuing a minor in Urban Studies & Planning, and considering a second minor in Applied International Studies. I hope to do another MISTI Internship after I graduate (perhaps involving teaching or international development in Mexico) and spend some time working abroad before applying to graduate programs.
Rachel Licht
Junior
Chemical Engineering

Internship at Total
Pau, France

Modeling Single Well Tracer Test for Enhanced Oil Recovery group

The Project:

- Single Well Tracer Test (SWTT)
- Determines residual oil saturation (ROS)
- New ROS test for Total
- SWTT literature survey
- Reservoir simulation program STARS
- Modeled SWTT in STARS
- Compared results to professional analysis
- Obtained repeatable results
  - Simple cylindrical model
  - Actual reservoir diagram

The Host:

- Total S.A.
- France’s oil company
- 6th biggest oil company
- 96,000 total employees
- Pau, Paris, International offices
- Pau Office
  - Restaurant with hot lunch
  - Library - books & movies
  - Language tutoring
- 30 min bus ride from center city
- Labo 5
  - Engineers & technicians
  - 8 college-age interns
  - Lab average age ~27
  - Very social in & out of work

Impact:

Work Impact
- Looking for jobs with oil companies
- Searching for good company culture
- Interest in computer modeling
- Pursing alternative energy

Cultural Impact
- Return to France during vacations
- Communicate with friends in France
- Pursuing graduate studies in France
- Increased interest in traveling

Life in Pau:

- 90,000 People
- 1 hour drive from Atlantic coast
- 1 hour drive from Pyrenees
- 1.5 hour drive from Spanish border
- Trains/Flights to major cities
- Tight, social community
- Outside restaurants, cafes & bars
- Henry 4th’s birthplace (chateau)
- River through city
- Shopping, movie theatres, pool halls etc.

Preparation:

Work Experience:
- 1 industry summer internship
- No previous oil industry experience
- No reservoir programming experience
- Read SWTT papers in spring

French Experience:
- 4 years before MIT
- 1 MIT class spring freshman year
- 1 Harvard class spring sophomore year
- No conversation practice

Back at MIT:

- French minor
  - Language & culture classes
  - Harvard & MIT
  - Interest in other languages
    - German I
    - Italian?
- French books, news & music
- Energy-related lab projects:
  - Hydrogen
  - Biodiesel
  - Ethanol
- Encourage MISTI participation!
Image Recognition:

Take a look at the top image on the right. In order to decipher the image, your brain is undergoing a complex task. The contours and contrast begin to tell the shape of the object, as in the B&W image in the center. The texture might be revealed thereafter. And soon enough, you will likely be able to tell that the image is a bird in a grass field (bottom image).

The most amazing aspect of image recognition is that the human brain is able to understand images instantly. No computer algorithm or software can do this as quickly or as accurately. Thus, we at Honda asked the fundamental question: How does the brain recognize images?

Honda Research Institute:

• More than just cars...
• Asimo, Honda’s a humanoid robot, has become one of Japan’s icons.
• Neural Engineering is another HRI focus, both in Tokyo and throughout Germany.
• HRI is located in Saitama, just 5 miles east of Ikebukuro, one of Tokyo’s most bustling areas.
• Honda has preserved the spirit of innovation funding several futuristic projects.
• A great environment fostering intellectual curiosity.

Impact:

At Honda, we are able to use EEG to measure the brain wave patterns that occur during image recognition. We found a 24Hz peak in the left frontal cortex and a 4Hz peak in the left temporal cortex.

Memory related tasks often involve the temporal and frontal cortex to work together in alpha and gamma waves to remember events/ideas. Perhaps our discovery sheds light on how the brain is making sense of the images we perceive.

Preparation:

My diverse experiences helped prepare me to tackle this project at Honda. Not knowing anything about Japan, I took 2 years of Japanese language and additional cultural training through MISTI. These skills helped me survive, both on the streets of Tokyo and in the office.

I also had a good mix of neuroscience and EE/CS training to help me analyze data. I had done fMRI research in the Jasanoff Lab, interned at Apple in the Graphics and Imaging Team, and learned and taught programming in Kenya, MIT, and Silicon Valley.

Life in Japan:

1.) Meiji-Jingu
2.) Kinkakuji
3.) Meiji-Jingu
4.) Mori Tower Aquarium
5.) Odaiba

Back at MIT:

As an aspiring physician scientist, I am always looking for that moment of insight. That moment when you know that your method will work. While abroad, I realized an aggressive, hypothesis-driven approach to attacking problems. Working side-by-side with electrical engineers, neuroscientists, and robotic gurus, we were able to begin unraveling a great mystery in the brain. I felt that being in Japan exposed me to a new way of thinking, one in which I will always keep in mind as I pursue a career in neuroscience.
Scot Frank
Electrical Engineering & Computer Science, 2009

Co-Invented the SolSource a low-cost and portable solar concentrator that meets the fuel needs of rural populations in the Himalayas

The Project:

The SolSource solar solution harnesses the sun’s energy for both cooking and heating and has the potential to abate 70% of rural household biomass emissions. Since light energy collected by the device is always in use, energy efficiency is maximized. Unwanted fires and dangerous exposures to the focus are also avoided by this strategy.

The SolSource:
- Provides both cooking and heating functionalities
- Wind and weather resistant
- Height eliminates need for squatting
- Energy efficiency prevents fires and injuries
- Portable: light-weight & foldable
- Accommodates traditional cooking practices
- Made from local, traditional, and low-tech materials
- Low maintenance & transparent
- Affordable relative to alternatives

Impact:
Reduction in fuel collection time, indoor air pollution, environmental and health effects. This provides women and children with educational and income generation opportunities.

Collaboration of communities, NGOs, universities, and researchers to address water, energy, and health problems faced in rural areas of the Himalayas.

The Community:

“Every year in the winter, I have pain in my lungs and cough a lot. I thought it was from the cold, but the doctor told me it is bronchitis. He said it was from breathing smoke.”

Sonam Doomtsa, resident of Quma Village (translation by Dorji Drolma)

“With a stove we can heat the house, but we cannot do so with a solar cooker... Even if we cook on a solar cooker, we still need to heat the house.”

Lamatsira, resident of Aruju village (translation by Dorjee Dondrub)

Preparation:

Coursework:
- Language classes at MIT and Harvard
- Business and entrepreneurship
- History and culture
- Engineering

- Device design and construction: Amy Qian
- Collaborators and advisors at MIT in Mechanical Engineering, Electrical Engineering, Media Lab, MIT Electric Research Society shop use.
- Communication with community members

Life in western China:

Back at MIT:

Co-founded One Earth Designs, an NGO that provides science and engineering support to community-based development projects in the rural Himalayas

Continued and expanded involvement in community and projects, including HeatSource, EnergySource, and WatMap

More information: http://www.OneEarthDesigns.org
Sean Liu
Junior, EECS
China Educational Technology Initiative, China Wireless Project
Taught OCW material, deployed MIT iLabs, and explored wireless technology applications

The Projects:
For CETI, we taught MIT Open Courseware at Dalian University of Technology and Zhejiang University, and helped in the operation of MIT’s iLabs, which enable remote teaching and experiments.

For the China Wireless Project, we traveled to Fuzhou, China to deploy pilot wireless mesh networks with Fuzhou University, Trigmax, and FuRiHeng Electronics. We formalized the creation of a Chinese wireless technology research lab and trained on-ground technical support.

The Hosts:
Dalian University of Technology (DUT):
DUT is located in Dalian, China, a northern coastal city known for its beautiful beaches and scenery. The university provided housing, food, facility access, and lab access.

Zhejiang University (ZJU):
ZJU, one of China’s most prestigious universities, is located in Hangzhou, China. The southern city is famous for West Lake.

Fuzhou University (FZU):
FZU recently opened its wireless technology research laboratory, and is working with MIT to explore the applications of wireless in bridging the digital divide.

Impact:
The CETI program was an opportunity to apply technical and language skills while exploring a new culture: tastes (from pig ears to sheep feet), sights (breathtaking mountains), smells (think Durian) and sounds (learning Chinese!).

Our China Wireless Project demonstrated the capabilities of wireless technologies, deployed trial sites, developed software, and initiated partnerships with institutions in China and the United States. The wireless covered a university lab and a local business.

Preparation:
CETI and China Wireless applied technical skills from MIT through sharing OCW curriculum with students and applying technologies. Language skills were needed to coordinate with administration, present material, and travel the nation.

Preparing for change was key, as often the situations required modifying curriculum, altering deployment plans, and addressing unanticipated problems. Anticipating potential challenges added flexibility and smoothed execution.

Life in China:
Dalian:
In Dalian, we had the chance to explore the gorgeous beaches, enjoy beautiful parks, and participate in an active night-life.

Hangzhou:
Hangzhou’s West Lake is world-famous for its exquisite beauty: towering pagodas, serene lake, ancient temples, and delightful food specialties.

Fuzhou:
Surrounded on three sides by lushious mountains and forests and bordered by the ocean, Fuzhou is known for its seafood specialties and beautiful mountain/ocean scenery.

Back at MIT:
The MISTI internships give us the opportunity to apply MIT skills and technology to real world challenges. We demonstrated how wireless mesh can be used to extend Internet coverage to rural and developing regions. In the process, we experienced the Chinese culture and worked with Chinese students and staff to create sustainable solutions.

Our team hopes to return to China to continue on the wireless deployment. In addition, I look forward to a career that works with both China and the United States in technology development.
Stephanie Nix
Senior, Biological Engineering

Internship at Merck Tsukuba, Japan
Worked on the early stages of oncology drug development

The Project:

Designed and made fluorescent probes to determine the pharmacokinetic and pharmacodynamic properties of drug candidates that target a specific pathway.

- Ran many series of microarrays with combinations of drug candidates and predetermined targets.
- Began work on an assay to detect concentrations of a target from cell lysate.

The Host:

Merck & Co. is an international pharmaceutical company based in the US that produces a number of drugs, such as Gardasil (HPV vaccine) and Vioxx (an NSAID).

- Merck has a number of laboratories established overseas, such as the Tsukuba Research Institute (TRI), where I worked last summer.
- Housing was provided by the company. I stayed in an apartment complex where unmarried company employees were housed.

Impact:

Working in Japan has helped me figure out what fields I would like to explore after graduation. I have decided to take a year off to work on a different project in Japan before applying to graduate school.

In addition, I was able to expand my horizons by being immersed in a distinctly different culture than my own. Getting to live truly on my own for the first time was one of the highlights of this experience.

Preparation:

I took two years of Japanese at MIT and participated in spring training offered by the MIT-Japan program. I also practiced talking to classmates outside of class in Japanese to get used to speaking conversationally.

The work I did in Japan was not directly related to things I had done in the past, but a number of BE classes taught concepts that I was able to use as I worked.

Life in Tsukuba:

Tsukuba is about an hour outside of Tokyo. It is a city that hosts a number of research laboratories out of the city, so it has both convenience and has nice scenery.

- There were a total of twelve interns working in Tsukuba over the summer, so there were often activities that took place within the group of interns.
- People at the company also organized a number of activities for some or all of the interns. Some of these activities included a trip to eat fresh kaiten sushi, a trip to Mt. Fuji, and numerous outings to nearby restaurants.

Back at MIT:

I’ve continued taking Japanese classes, so that my Japanese can be more useful, and I can be more comfortable interacting in Japan.

- I have decided that, while the work I did was interesting, I’d like to work in a different area of biological engineering.
- This summer, I will be working in Nara, Japan for the summer, then plan to work in Sendai - northern Japan - for approximately a year. Both projects will be more computationally intensive than my project last summer.
Internship at The Weizmann Institute
Rehovot, ISRAEL

Small organic molecules like Perylene Diimide possess high absorptivity of visible light. Using molecular recognition, we develop methods to self-assemble these molecules into photo-active nano-wires in aqueous medium, which use solar energy to transport electric charge.

The Project:
A molecule that tethers together an electron donor and a photo-acceptor, shown schematically in Figure 1, absorbs a photon and results in a dyadic exciton. These units, if designed to recognize one another and assemble in a linear fashion, could delocalize photo-generated excitons into free electrons and holes.

Impact:
Previously, the Rybtchinski group has studied self-assembling chromophores. My project was the first to explore the possibility of a donor-acceptor dyad because of my use of Rhodium (I), a highly electron-rich metal, allowed charge-transfer to perylene diimide to be thermodynamically favorable.

Life in Rehovot:
Rehovot was a great place to live. The community on campus through the dormitory offered many ways to meet peers in the program and grad students at Weizmann. Seminars in various topics were constantly going on. One of my favorite activities was just to talk science at the on-campus cafe with professors and students. The city outside provided access to good (and cheap!) restaurants, bars, etc. It was easy to get to Tel Aviv, where there was a night life scene, great beaches, and a rock-climbing center that my friends liked to frequent.

Preparation:
I have worked as an undergraduate researcher (UROP) in the Nocera Group for the past three years. The Nocera Lab is focused on elucidating basic elements of molecular chemistry for renewable energy. We have had impacts in mixed-valent chemistry for H-X elimination and water oxidation catalysts.

Back at MIT:
By learning photophysical chemistry last summer, my research interests have leaned more toward the study of fundamental aspects of light-matter interaction.

This year, I am teaching a Hebrew grammar class to beginners through the new MIT Hillel/MISTI Israel Exchange program. From my foundation, the class will continue to be taught in future years, and will be a resource (and potentially later, a requirement) for MISTI-Israeli participants.

The following year, I will be pursuing studies toward a Ph.D. in Chemistry at Stanford University; however, I have strong plans to return to the Weizmann some day, perhaps for a post-doctoral fellowship.