Thinking Outside the Local Laboratory Box: The Hong Kong JUSTL Program

Web-site: **http://ihome.ust.hk/~aequorin/justl2007/index.html**

Founded and Directed by:

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香港科技大學
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

MBL
MARINE BIOLOGICAL LABORATORY
Woods Hole, Massachusetts 02543, USA

The JUSTL Program is funded by:

MAIN GOALS OF THE JUSTL PROGRAM

- To help further develop the ability of young Hong Kong scientists to think creatively about biological questions.
- To enhance their ability to act and work independently.
- To expose them to doing research in the international arena outside Hong Kong.

CREATIVITY

Creativity (or "creativeness") is a mental process involving the generation of new ideas or concepts, or new associations between existing ideas or concepts.

From a scientific point of view, the products of creative thought are usually considered to have both *originality* and *appropriateness*.

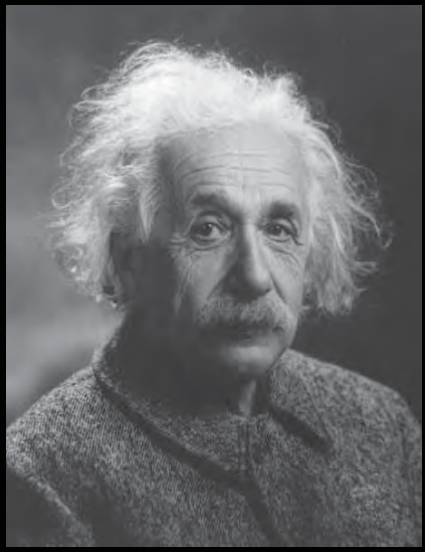
An alternative, more everyday conception of creativity is that it is simply the act of thinking or making something new.

Ludwig van Beethoven (1770-1827), German composer and virtuoso pianist. He was an important figure in the transitional period between the Classical and Romantic eras in Western classical music, and remains one of the most famous and influential musicians of all time.

Jimi Hendrix (1942-1970) was an American guitarist, singer and songwriter. Hendrix is considered one of the greatest and most influential guitarists in rock music history. After initial success in England, he achieved worldwide fame following his 1967 performance at the Monterey Pop Festival. Later, he headlined the iconic 1969 Woodstock Festival.

From: http://en.wikipedia.org/

Albert Einstein (1879-1955) was a German-born theoretical physicist. He is best known for his theory of relativity and specifically mass-energy equivalence, $E = mc^2$. Einstein received the 1921 Nobel Prize in Physics "for his services to Theoretical Physics, and especially for his discovery of the law of the photoelectric effect."



From: http://en.wikipedia.org/

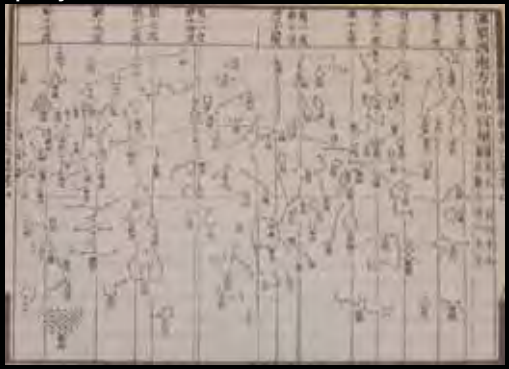
Pablo Ruiz Picasso (1881-1973), often referred to simply as Picasso, was a Spanish painter and sculptor. His full name is Pablo Diego José Francisco de Paula Juan Nepomuceno María de los Remedios Cipriano de la Santísima Trinidad Clito Ruiz y Picasso. One of the most recognized figures in 20th century art, he is best known as the co-founder, along with Georges Braque, of cubism.

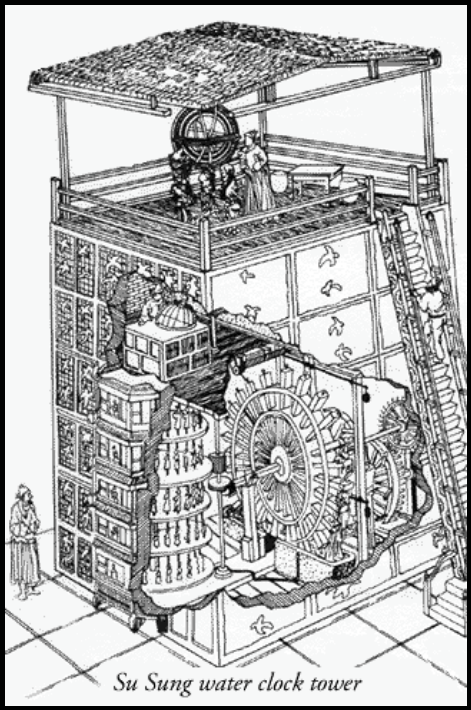
From: http://en.wikipedia.org/

Su Song (蘇頌) (1020-1101) was a renowned Chinese statesman, astronomer, cartographer, horologist, pharmacologist, mineralologist, zoologist, botanist, mechanical and architechtural engineer, and ambassador of the Song Dynasty (960-1279 AD).

Su Song was the engineer of a water-driven astronomical clock tower in medieval Kaifeng.

Su Song also created a celestial atlas and compiled one of the greatest Chinese horological treatises of the Middle Ages, surrounding himself with an entourage of notable engineers and astronomers to assist in various projects.





From: http://en.wikipedia.org/

Louis Pasteur (1822-1895) was a French chemist best known for his remarkable breakthroughs in microbiology. His experiments confirmed the germ theory of disease, also reducing mortality from puerperal fever (childbed), and he created the first vaccine for rabies. He is best known to the general public for showing how to stop milk and wine from going sour - this process came to be called pasteurization. He also made many discoveries in the field of chemistry, most notably the asymmetry of crystals.

From: http://en.wikipedia.org/

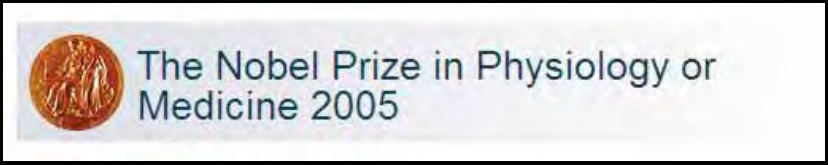
Maria Skłodowska-Curie (1867-1934) was a physicist and chemist of Polish upbringing and, subsequently, French citizenship.

She was a pioneer in the field of radioactivity, discovering the existence of polonium and radium.

She was the first twice-honored Nobel laureate (and still the only one in two different sciences) and the first female professor at the University of Paris.

From: http://en.wikipedia.org/

Barry J. Marshall (1951-) and **J. Robin Warren** (1937-) are well-known for proving that the bacteria *Helicobacter pylori* is the cause of most stomach ulcers, reversing decades of medical doctrine which held that ulcers were caused by stress, spicy foods, and too much acid.



From: http//en.wikipedia.org/ and http://nobelprize.org/

CAN YOU ENHANCE THE DEVELOPMENT OF CREATIVITY BY PROVIDING A CREATIVE ENVIRONMENT?

I think that you can.

This led me to found the JUSTL Program based at the MBL.

The JUSTL Program

The **Joint Universities Summer Teaching Laboratory (JUSTL)** program is an **8 week intensive research and learning experience** for Hong Kong postgraduate students at the **Marine Biological Laboratory (MBL)** in Woods Hole, MA, USA.

Aerial view of the MBL

Brief History of the MBL

What is the MBL?

- Lewis Thomas called it America's "National Biological Laboratory".

1913 - 1993

Lewis Thomas: Physician, poet, essayist, educator and researcher. He won the National Book Award for "The Lives of a Cell". He was Dean of Yale and NY Medical Schools and the Lewis Thomas Prize is awarded by the Rockerfellar University to a scientist with artistic merit.

- Founded by experimental biologists for experimental biologists.
- Not controlled by any university but is owned by a “corporation” of biologists.
- International center for progress in basic biological research and education.

Q: Where is the MBL? A: In Woods Hole on Cape Cod, MA

Beautiful Cape Cod! One of the East Coast's Summer Playgrounds for Sun, Sand and Science!

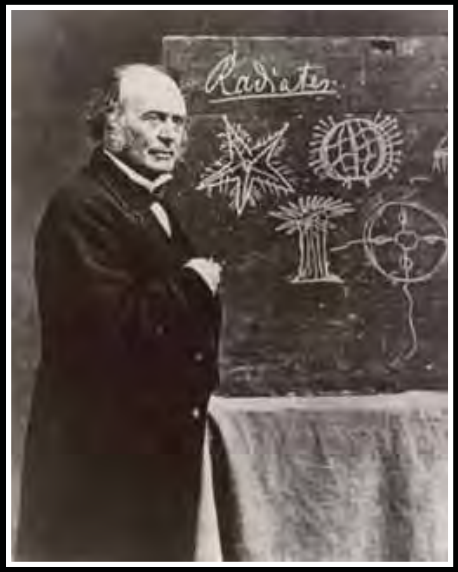
What were the Origins of the MBL?

- How did it all start?
- Who was responsible?

Eel Pond, 1894

Early days: MBL collecting boat

Louis Agassiz (1807-1873)



One of the great scientist of his day, and one of the "founding fathers" of the modern American scientific tradition. Swiss born, but he moved to America in 1846 and accepted a Professorship at Harvard in 1848. He founded the Museum of Comparative Zoology at Harvard University, he helped create and was a founding member of the National Academy of Sciences, and he founded the Anderson School of Natural History in 1873. The latter is regarded as the forerunner of the MBL, which opened in 1888.

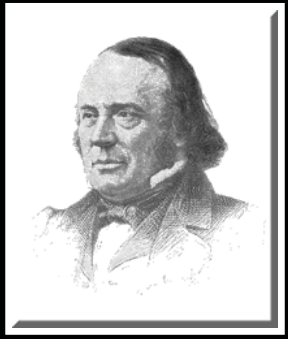
Anderson School of Natural History

In 1873 Agassiz founded the Anderson School of Natural History at Penikese Island off the southern tip of Cape Cod, Massachusetts. Although it did not survive long after Agassiz's death in 1873, the school was a point of contact between Agassiz and several notable students, including Charles O. Whitman, who eventually became the founding director of the MBL when it opened in 1888, some 15 years later.

A famous dictum of Louis Agassiz was:

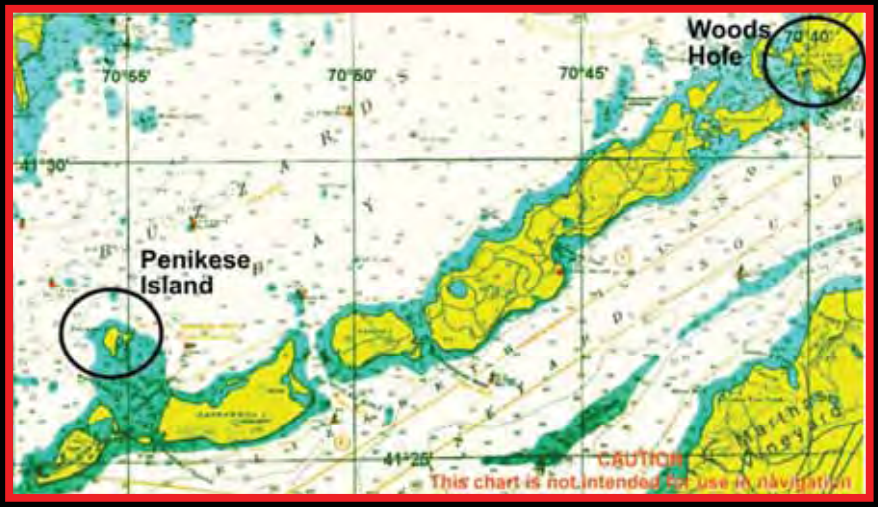
"Study Nature Not Books"

Ironically, this hangs on the wall in the MBL Library!

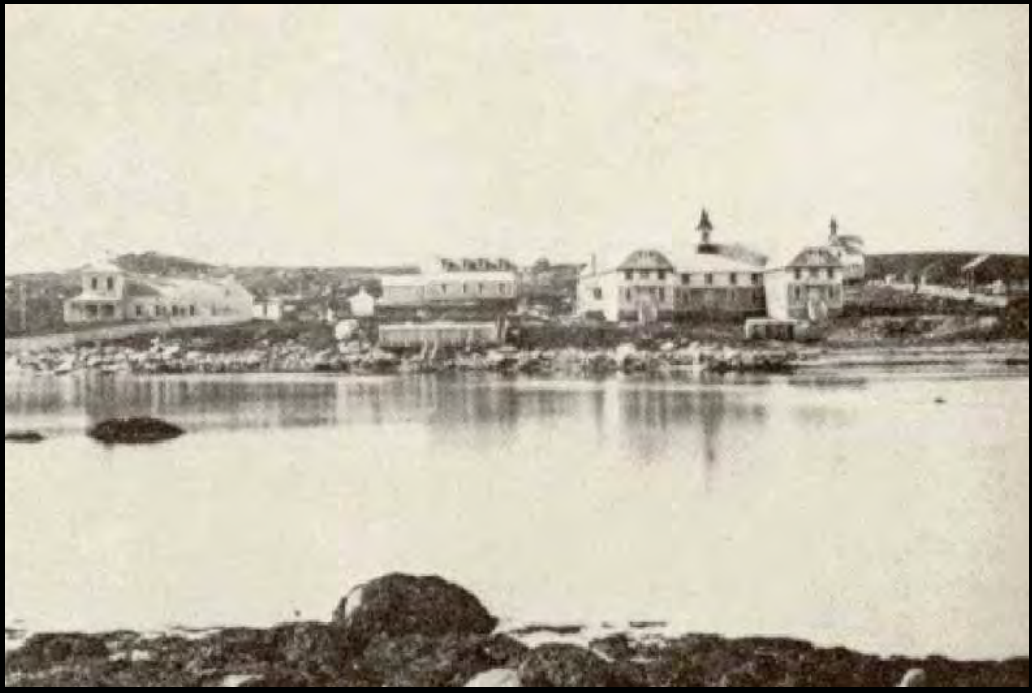


Louis Agassiz (1807-1873)

Location of Penikese Island in Relation to Woods Hole

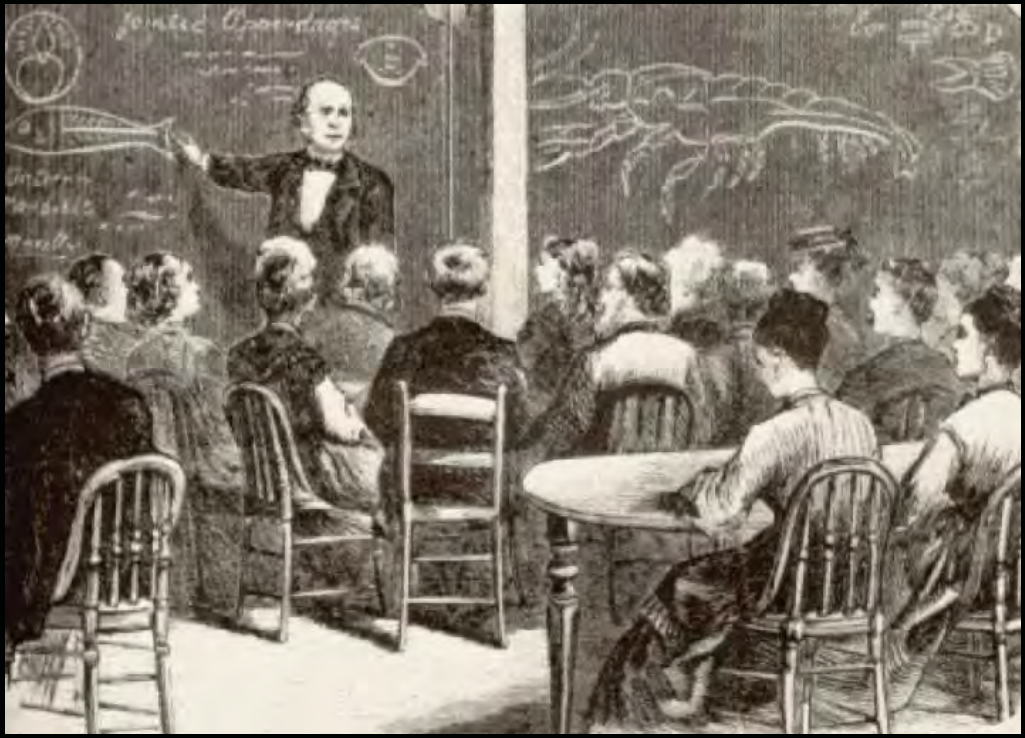


The isolation of the Anderson School of Natural History on Penikese Island was one of the factors that led to its demise. In 1905, in response to a public health panic, the State of Massachusetts selected Penikese Island as the site of a State leprosy hospital!



Anderson School of Natural History 1873

From: Lurie (1988)



Agassiz lecturing at the Anderson School of Natural History

From: A contemporary illustrated magazine of the time.

Founding of the MBL in 1888

- The idea of establishing a new summer research and teaching laboratory along the lines of the Anderson School of Natural History was realized through the establishment of the MBL in 1888.
- Penikese Island was considered too isolated, so the village of Woods Hole was selected as the location for the new laboratory.
- One of Louis Agassiz's students from the Anderson School, Prof. Charles O. Whitman of the University of Chicago, was appointed as the founding director of the MBL.

Prof. Charles O. Whitman (1842-1910)

Whitman served as the Director of the MBL for the first 20 years of its existence. He was also Professor of Zoology at the University of Chicago. He believed in open collaboration among scientist regardless of institutional affiliations. He was, therefore, a perfect choice as the MBL's Founding Director.

"Unaffiliated with any university, supported by a small endowment and researchers' federal grants, the MBL was founded in 1888 as a place where scientists could get away from their routine pressures and do biology, teach it and talk about it."

Quote from an article in *The Boston Globe*

As well as Research, Education in the Biological Sciences was a founding Goal of the MBL as it had been at the Anderson School of Natural History

August 1895: Invertebrate Zoology Class on the MBL's Collecting schooner *Vigilant*

July 1897: Embryology Course collecting trip to Quissett Harbor. Gertrude Stein, a student at the MBL, is seen in the foreground wearing the long dark skirt.

Gertrude Stein (1874 – 1946): American writer and poet and catalyst in the development of modern art and literature. She coined the term "Lost Generation" For the expat American writers and artist living in Paris in the 1920s.

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The MBL started out as a Summer laboratory and was open only for the months of June, July and August.

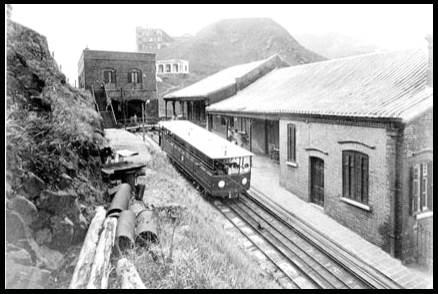
Thus, scientist came to the MBL from their own universities to take advantage of the abundance of marine animals to use in their research. For example, neurobiologist used the giant axon of the squid, while embryologists studied the development of sea urchin eggs.

At the end of the "Summer Season" they packed up their MBL laboratories and returned "home".

This "part time" model of a research institute is now economically not feasible. The MBL has thus transformed itself into a year-round institute, but has maintained its traditional summer science program and summer educational courses.

Place in a historical context with events in Hong Kong:

- **1887** – The "Hong Kong College of Medicine for Chinese" was founded by the London Missionary Society. This eventually developed into the University of Hong Kong in 1910.
- **1888** – The Peak Tram opened in Hong Kong.
- **1898** – The New Territories were leased from Qing China to Britain for 99 years following the signing of the "Second Treaty of Peking".



The Peak Tram 1888

HKU main building soon after its opening in 1912

Connection between China and the MBL

- **Charles R. Crane** (1858 -1939) was a wealthy American businessman and philanthropist with a keen interest in China.
- He helped finance the T'ung Meng Hui (Together-Sworn Association) a secret society founded in 1905 by Sun Yat-Sen, striving to overthrow the Qing dynasty.
- Sun Yat-Sen was one of the first two graduates of HK College of Medicine.
- In 1911, the Qing dynasty was overthrow by the *coup d'etat* led by Sun Yat-Sen.
- In 1920, Crane was appointed as the American Minister (Ambassador) for China.

Charles R. Crane

Crane had a holiday home in Woods Hole, and actively supported the MBL, financing the building of its first permanent brick laboratory, now part of the Lillie Building.

Summer "cottage" Crane built on his Woods Hole estate in 1912 for his daughter, Josephine Crane Bradley, as a wedding present

The Crane Wing (1913) of the Lillie Building at MBL

Confucius at MBL

This statue of Confucius was a gift to the MBL from Charles R. Crane (1858-1939) who was appointed as the American Minister to China in 1920 by President Woodrow Wilson. Confucius can be found in the Crane Wing of the Lillie Building, the former, erected in 1913 with funds donated by Crane, was the MBL's first permanent building.

There is an MBL tradition to the effect that if one occasionally leaves a penny in Confucius' hands for local children to find, one's experiments will be rewarding. If, however, one offends Confucius then one's work will be fit only for publication in THE JOURNAL OF NEGATIVE RESULTS.

Development of the MBL

- What has the MBL done to deserve the rich accolade bestowed by Lewis Thomas as being America's "National Biological Laboratory"?

MBL's Lillie Laboratory

Lewis Thomas

Nobel Laureates Affiliated with the MBL

- Since 1920, 54 Nobel Prizes have been won by MBL-affiliated scientist.
- Most laureates were awarded the Nobel Prize in the category of Medicine or Physiology.
- However, a few won prizes in the categories of Physics or Chemistry.
- For example, the 2006 MBL-affiliated laureate Dr. Roger D. Kornberg.

Nobel Prize Winners

- **2006** Roger D. Kornberg (Instructor: Physiology Course): Studies of the molecular basis of eukaryotic transcription.
- **2004** Avram Hershko (MBL summer investigator) and Irwin Rose (MBL Embryology Course Alumnus): Discovery of ubiquitin-mediated protein degradation.
- **2003** Roderick MacKinnon (Faculty: Neurobiology Course): For structural and mechanistic studies of ion channels.
- **2002** Sydney Brenner (Instructor: Physiology Course) and H. Robert Horvitz (Instructor: Physiology Course): Discoveries concerning genetic regulation of organ development and programmed cell death.
- **2001** Tim Hunt (Instructor: Physiology and Embryology Courses): Discovery of cyclins, a group of proteins that regulate the cell division cycle.

- **2000** Eric Kandel (Summer Investigator) and Paul Greengard (Instructor: Neurobiology Course): Discoveries concerning signal transduction in the nervous system.
- **1997** Jens C. Skou (Summer Investigator): Discovery of an ion-transporting enzyme, Na^+ , K^+-ATPase.
- **1995** Eric Wieschaus (Student then Instructor: Embryology Course) and Christiane Nussleinn-Volhard (Instructor: Embryology Course): Discoveries concerning the genetic control of early development.
- **1991** Bert Sakmann (Instructor: Neurobiology Course): Discoveries concerning the function of single ion channels in cells.
- **1989** Sidney Altman (Instructor: Physiology Course): Discovery of the catalytic properties of RNA
- **1986** Stanley Cohen (Instructor: Embryology Course): Discovery of growth factors.

"Discovery is to see what everybody has seen and think what nobody has thought"

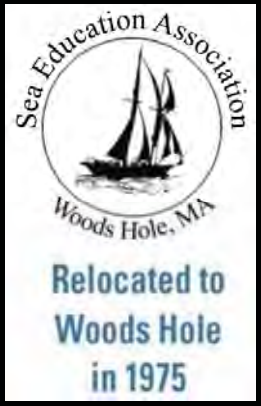
Albert Szent-Györgyi, Nobel Laureate and MBL Scientist

Albert Szent-Gyorgyi's Nobel Prize Certificate, at the MBL

Other Scientific Institutes in Woods Hole

- Important to realize that the MBL is not the only scientific institute in the small village of Woods Hole.
- The geographical location of Woods Hole on Cape Cod, jutting out into the North Atlantic, made it a perfect location for other maritime-based scientific institutes.
- JUSTL Program participants are also able to interact with individuals and groups at any of these institutes.

Woods Hole Institution Time Line:



SEA training vessel

US National Marine Fisheries building

WHOI

WHOI Biology Laboratories

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JUSTL Program participants have the opportunity to collaborate with investigators at the other scientific institutions in Woods Hole.

In the small village of Woods Hole, this concentration of scientific institutions results in a scientific community that is unparalleled anywhere else in the world.

WHOI

WHOI dock

Summary of the MBL:

MBL
MARINE BIOLOGICAL LABORATORY
Woods Hole, Massachusetts 02543, USA

The Research Environment

The **Marine Biological Laboratory (MBL)** is an international center for research, education, and training in biology.

During the summer season, the 200 year-round scientists and support staff of the MBL are joined by an additional 800 scientists, graduate and postdoctoral students from over 200 institutions around the world.

Many studies have broad biomedical implications. In addition, the MBL's Ecosystem Center houses a large group of marine ecologists, microbiologists, and population geneticists.

Back to the JUSTL Program!

- Enough history!
- But just enough to put the MBL in both a historical and contemporary context.
- The questions now to ask are:

1. What is the JUSTL Program?
2. What can participating in the JUSTL program and visiting the MBL do for your career development?

Essence of the JUSTL Program:

JUSTL program participants: (1) Conduct individual research projects, (2) Attend lectures and seminars, as well as (3) Undergo training in specialist techniques and methodologies.

These activities are under the guidance of the JUSTL Program Director as well as volunteer MBL Summer Scientist Mentors, drawn from institutions from around the world (more about MBL summer mentors later).

The JUSTL program is scheduled to run for the months of **June and July, and is currently funded to run until 2012**. This is to coincide with the MBL's three prestigious summer courses: **Embryology, Physiology and Neurobiology**.

The Summer Lab

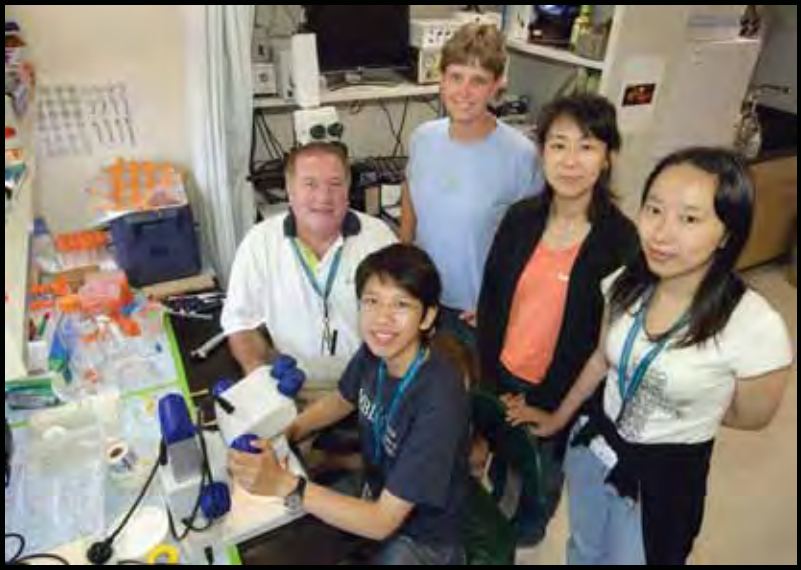
The **JUSTL summer lab** is the **hub** of the JUSTL program's activities.

It provides bench space for JUSTL participants to carry out their summer research. It also houses JUSTL program equipment and consumable supplies, it provides internet access for JUSTL participants to keep in touch with their home labs back in Hong Kong, and it provides a meeting place for JUSTL participants to discuss and share their MBL summer season experiences.

The nascent JUSTL Program Lab,
Rowe Building, MBL (June 1st, 2007)

The Up-and-Running JUSTL Program Lab., Rowe Building, MBL

(July 2007)



Front row: Prof. Andrew L. Miller (JUSTL program director) and Cora Sau-Wan Lai. **Back row:** Dr. Karen Crawford (JUSTL program mentor), Xiao Nan and Katherine Yueping Qian.

The JUSTL Program Lab is located in the Rowe Laboratory building at the MBL. The primary function of this building is to house the MBL Summer Scientist Program.

Rowe building from Great Harbor

JUSTL PROGRAM 2007

On the front steps of the Lillie Building, MBL, Woods Hole

Back row: Prof. Andrew L. Miller (JUSTL program director), Junyu Xu (JUSTL participant) & Prof. Robert Baker (Co-Director and JUSTL mentor). **Middle row:** Cora Sau-Wan Lai (JUSTL participant), Dr. Karen Crawford (JUSTL mentor) and Alice Lie (JUSTL participant). **Front row:** Summer Min Shen, Yueping Qian & Xiao Nan (all JUSTL participants).

1. Summer Research Project

A major portion of each student's time at the MBL is dedicated to an individual research project.

Students have the opportunity to interact with scientists from around the world, to be introduced to the latest research technologies, and to experience first-hand the intensity, enthusiasm, and excitement for which the MBL summer experience is known.

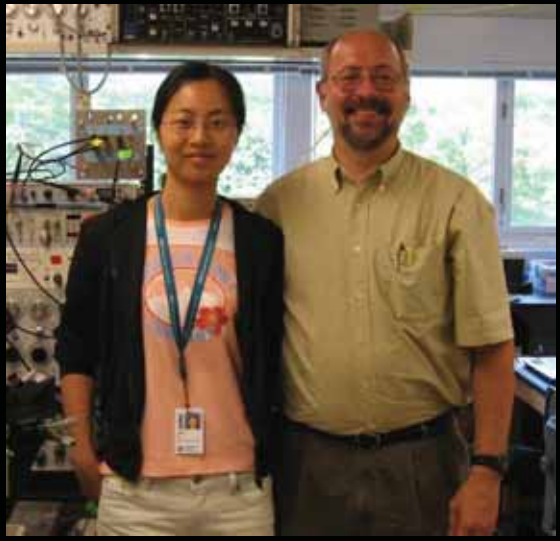
The Yalden sundial in front of the Lillie Laboratory

MBL Summer Scientist Mentorship:

Over 20 leading MBL Summer scientists have volunteered to serve as JUSTL Program Mentors. A list of these individuals can be found on the JUSTL Program website with a link to their lab homepages. If a JUSTL students wishes to work in the lab of one of these summer mentors, this will be arranged.

MRC – Animal Holding Tanks

Junyu Xu (Biochemistry, HKUST)

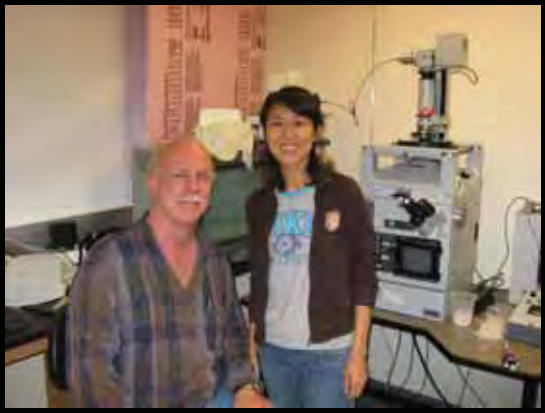


2007 JUSTL Mentor: Prof. George Augustine (Duke University)

Summer Min Shen (Biol & Chem, CityU)

2007 JUSTL Mentor: Dr. Roxanna Smolowitz (MBL)

Tori Xiao Nan (Biochemistry, HKUST)



2007 JUSTL Mentors: Prof. Scott Brady (U. of Illinois at Chicago)….

…and Prof. Enrico Nasi (Boston U. School of Medicine).

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Research Facilities at the MBL:

The MBL houses a number of unique research facilities. These include a state-of-the-art **Marine Resources Center (MRC)**, which provides the latest approaches in husbandry and mariculture of marine organisms; the NIH-supported **BioCurrents Research Center**; a **Central Microscopy Facility** housing advanced 2-photon fluorescent confocal microscopes combined with computer imaging; the **Ecosystems Center;** and the **MBL/WHOI Library**, which is one of the most complete science libraries in the world.

The Marine Resources Center

Inside the MRC

Salt water fish holding tank

Squid in holding tank

Salt water specimen holding tank

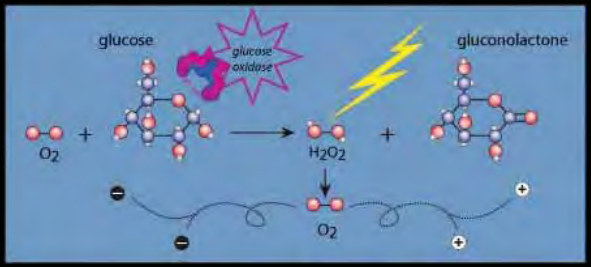
Not just marine animals: zebrafish facility

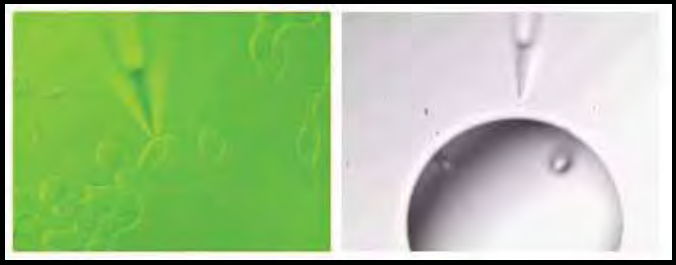
Central Microscopy Facility (CMF):

State-of-the-art 2-photon confocal microscopy

Motor driven stage for simultaneous imaging and electrophysiology

Zeiss LSM 510 META
4 confocal channels for reflected light
1 channel for transmitted light





Images of the research and equipment at the MBL's BRC

The Ecosystems Center

at the Marine Biological Laboratory

The MBL Ecosystems Center carries out research and education in ecosystems ecology. Terrestrial and aquatic scientists work in a wide variety of ecosystems ranging from forests, streams, lakes, estuaries, sediments, oceans and arctic tundra.

The MBL/WHOI library:

Main Library building

Reading desks

Journal stacks

Computer facilities

2. Lectures and Seminars:

As the MBL hosts many educational courses, which run throughout the summer, there are numerous opportunities to attend a variety of seminars and lectures. These include:

1) The world famous Embryology, Physiology and Neurobiology Summer courses that have been running for over 100 years. These courses draw their instructors from leading researchers in their respective fields and each offers a daily lecture or seminar series, which is open to the scientific community at large.

2) The "MBL Friday Night Lecture Series" brings in speakers of particular note who are of interest to a wider audience.

3) A number of courses and groups sponsor informal evening or lunch-time seminars.

JUSTL students are encouraged and expected to attend these summer course lectures whenever possible, as well as research seminars specifically designed for JUSTL participants.

What MBL Summer Courses have to offer:

1. Superb instruction provided by leading faculty recruited from dozens of the finest universities and institutes in the US and around the world.
2. Remarkably high faculty to student ratios, with some courses approaching a ratio of 1:1
3. State-of-the-art equipment.
4. A range of the latest research techniques as they are evolving in the most productive labs around the world.

MBL Course benefits continued:

5. A range of model organisms, both marine and non-marine.

6. A broad perspective on the current areas of research as they are being shaped in the home labs of the course faculty and visiting lecturers

The MBL's highly competitive summer courses are famous among scientists, who send their most promising students off to what has been affectionately called:

"the boot camp for biologists."

James Watson, who received the Nobel Prize for his co-discovery of the DNA double helix, earned his stripes as an instructor:

"The physiology course is frightfully intense, and I have never worked so hard in my life."

Embryology

Directors: Lee Niswander, *University of Colorado Health Sciences Center, Denver/HHMI*; and Nipam H. Patel, *University of California, Berkeley/HHMI*.

Course Date: June 14 - July 27, 2008

Online Application Form, (PDF) Deadline: **February 1, 2008**

2007 Course Schedule | Student Course Evaluation

2007 Faculty and Lecturers:

Sharon Amacher, University of California, Berkeley
Clare Baker, University of Cambridge
Richard Behringer, MD Anderson Cancer Center
Marianne Bronner-Fraser, California Institute of Technology
C. Titus Brown, California Institute of Technology
Andres Collazo, House Ear Institute
Cassandra Extavour, University of Cambridge
Marie-Anne Felix, Institut Jacques Monod
Scott Fraser, California Institute of Technology
John Gerhart, University of California, Berkeley
Richard Harland, UC Berkeley
Jonathan Henry, University of Illinois
Raymond Keller, University of Virginia
Nicole King, UC Berkeley
Catherine Krull, University of MichiganDavid Lambert, University of Rochester
Michael Levin, Forsyth Institute/Harvard University
Amy Maddox, University of California at San Diego
Mark Martindale, Univ. Hawaii
David McClay, Duke University
Denise Montell, Johns Hopkins School of Medicine
Paola Oliveri, Caltech
Kimberly Perry, University of Illinois
Olivier Pourquie, HHMI/Stowers Institute for Medical Resea
Daniel Rokhsar, UC Berkeley
Joel Rothman, UC Santa Barbara
Alejandro Sanchez Alvarado, HHMI, University of Utah
Joshua Sanes, Harvard
Elaine Seaver, University of Hawai
Lori Sussel, University of Colorado Health Sciences
Maximilian Telford, University College London
Paul Trainor, Stowers Institute
Eric Wieschaus, Princeton University
Deborah Yelon, Skirball Institute, NYU School of Medici
Robert Zeller, San Diego State University

Neurobiology

Director: Hollis Cline, *Cold Spring Harbor*

Course Date: June 7 - August 3, 2008
Online Application Form, (PDF) Deadline: **February 1, 2008**
Student Course Evaluation | 2007 Lecture Schedule

2007 Faculty and Lecturers:
Gordon Wang, *Stanford University*
Christine Beattie, *The Ohio State University*
Andrew Chisholm, *UC San Diego*
Kathryn Commons, *Children's Hospital/Harvard Medical*
Matthew Dalva, *University of Pennsylvania*
Joe DeGiorgis, *NIH*
Elva Diaz, *UC Davis*
James Galbraith, *National Institutes of Health*
James Galligan, *Michigan State University*
Paul Heinon, *The Ohio State University*
Kristen Harris, *University of Texas, Austin*
Christopher Honda, *University of Minnesota*
Yishi Jin, *University of California, San Diego*
Yulong Li, *Stanford University*
Isabel Llano, *CNRS*
Alain Marty, *CNRS*
Kristina Micheva, *Stanford University*
Thomas Misgeld, *Technical University Munich*
Jorge Moreira, *USP, Ribeirão Preto School of Medicine*
Alberto Pereda, *Albert Einstein College of Medicine*
Tom Reese, *NIH*
Stephen Smith, *Stanford University Medical School*
Michael Szulczewski, *Prairie Technologies, Inc.*
Mark Terasaki, *University of Connecticut Health Center*
Wesley Thompson, *University of Texas at Austin*
Heather Wenk, *Gustavus Adolphus College*
John Williams, *OHSU*
Junichi Yagi, *Kyorin University*
Joshua Zimmerberg, *NICHD*
Yi Zuo, *UC Santa Cruz*
Thomas Oertner, *Friedrich Miescher Institute*
Susan Ackerman, *The Jackson Laboratory*
Graeme Davis, *UCSF*
Catherine Galbraith, *NIH*
John Lisman, *Brandeis University*
Gail Mandel, *Howard Hughes Medical Institute, OHSU*
Louis Ptacek, *HHMI/UCSF*

Physiology: Modern Cell Biology Using Microscopic, Biochemical and Computational Approaches

Directors: Timothy J. Mitchison, *Harvard Medical School*, and Ronald D. Vale, *University of California, San Francisco*

Course Date: June 14 - August 3, 2008

Online Application Form, (PDF) Deadline: **February 1, 2008**

2007 Faculty & Lecturers:

Bruce Alberts, *University of California, San Francisco*
Eric Betzig, *Janelia Farm Research Campus*
William Bialek, *Princeton University*
Michael Brenner, *Harvard*
Joan Brugge, *Harvard Medical School*
Marileen Dogterom, *FOM Institute AMOLF*
Christine Field, *Harvard Medical School*
Arthur Horwich, *Yale School of Medicine*
Anthony Hyman, *MPI-CBG*
Frank Julicher, *MPI for the Physics of Complex Systems*
Eric Karsenti, *EMBL*
Susan Lindquist, *Whitehead Inst. for Biomedical Research*
Jennifer Lippincott-Schwartz, *NICHD, National Institutes of Health*
Gavin MacBeath, *Harvard University*
Thomas Müller-Reichert, *Max Planck Inst. of Mol. Cell Biology*
Dyche Mullins, *UCSF*
Edwin Munro, *University of Washington*
Garrett Odell, *University of Washington*
Erin O'Shea, *HHMI/Harvard University*
Carl Pabo, *Harvard Medical School*
Rob Phillips, *Caltech*
Pardis Sabeti, *MIT*
Pamela Silver, *Harvard Medical School*
Nico Stuurman, *UCSF/HHMI*
Alice Ting, *MIT*
Clare Waterman, *National Institutes of Health*
Watt Webb, *Cornell University*
David Weitz, *Harvard University*
Eric Wieschaus, *Princeton University*

3. Specialist Training

An important feature of the JUSTL Program will be the opportunity to undergo specialist training in a variety of techniques and methodologies during the time spent at the MBL. Depending on the interests of JUSTL Program participants, these training sessions will be organized by the JUST Program Director and involve instruction from visiting experts in each field. Possible areas that will be covered might be:

1. **2-photon confocal microscopy.**
2. **Microinjection.**
3. **Electrophysiology techniques.**
4. **Image processing.**
5. **Molecular genetic techniques (e.g., the use of RNAi).**
6. **Advanced techniques in computational analysis.**

Eligibility:

In order to receive support from the Croucher Foundation, JUSTL participants must be **citizens** or **permanent residents** of **the Hong Kong SAR**.

Applicants must be enrolled in a postgraduate program (part-time or full-time) leading to a higher degree (Ph.D. or M.Phil.). Preference will be given to Ph.D. program applicants.

Students who are transferring from one institution to another and are enrolled at neither institution during the intervening summer may also apply.

Individuals who have already received their doctorate degrees are not eligible.

Eligible candidates are encouraged to apply from the following Universities in Hong Kong:

Application Process:

The deadline for 2008 application is **January 11th, 2008**.

Applications will be evaluated after the January deadline and then short-listed candidates will be interviewed. Successful applicants will be notified in the last week of January.

At this time, additional MBL registration and MBL housing application information will be provided.

Boats leaving Eel Pond

Students are selected based on their academic credentials, their reference letters, the overall quality of their application package and how they perform during the interview.

The selected students will be matched (where necessary) with JUSTL-associated MBL summer scientist mentors based on their area of research interest, previous experience, use of a particular model or the desire to learn a new research technique.

It is expected that students' supervisors will actively participate in the selection of MBL Summer Scientist mentors in order to maximize the learning experience of JUSTL participants.

Flexibility is the key. We want each student to get the most out of his/her visit to the MBL!

Eel Pond

Financial Support for JUSTL Program Participants:

Selected JUSTL participants can expect a **substantial degree** of financial support for travel, accommodation and living expenses from funds provided to the JUSTL Program by the Croucher Foundation and the Government of the HKSAR.

Students will, however, be encouraged to make some contribution towards the costs of participating in the Program, either via funds obtained from their own Universities/Schools/Departments, from their own supervisor's research support or a personal contribution.

Funds contributed from these sources will help to fund the daily running costs of the JUSTL.

Whitman Lab from Great Harbor

香港科技大學
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

Contact:

Prof. Andrew L. Miller,
Dept. Biology,
HKUST.
E-mail: almiller@ust.hk

MBL
MARINE BIOLOGICAL LABORATORY
Woods Hole, Massachusetts 02543, USA

MBL, Woods Hole

HKUST

Web-site: **http://ihome.ust.hk/~aequorin/justl2007/index.html**

JUSTL 2008

6 June - 3 August, 2008

Marine Biological Laboratory

Funded by:

The Croucher Foundation

GovHK 香港政府

Confucius at the MBL

The Hong Kong Joint Universities Summer Teaching Laboratory 2008

The JUSTL Program: **The Joint Universities Summer Teaching Laboratory (JUSTL) program is an eight-week intensive research experience (running from 8 June - 3 August, 2008) for PhD students at the Marine Biological Laboratory (MBL) in Woods Hole, Massachusetts, USA. Students will attend lectures and seminars, undergo training, and conduct individual research projects under the guidance of the JUSTL Director as well as leading MBL Summer Scientist mentors drawn from institutions from around the world.**

Call for Applicants

Application & Evaluation Forms
are available at: http://home.ust.hk/~aequorin/justl/index.html

Essential Application Dates:
Application submission due by: 11 January, 2008
Shortlisted applicant interviews (held at HKUST): 17-18 January, 2008
Notification of selected applicants: 21 January 2008

Information Session (for prospective applicants) will be presented by the JUSTL Program

Eligibility

JUSTL participants must be:
1) Citizens or permanent residents of the Hong Kong SAR.
2) Enrolled in a postgraduate program (part-time or full-time) leading to a PhD degree in a *Life Sciences discipline.

*Suitable for students of: Cell, Molecular, Developmental, Neuro, Plant, Environmental, Marine & Structural Biology, as well as Ethology, Ecology, Physiology & Zoology.

For further details contact:
The JUSTL Program Director - Prof. Andrew L. Miller (e-mail: almiller@ust.hk, tel: 852 2358 8631) or visit the JUSTL Program web-site

Many Thanks

THANK YOU!

Eel Pond, Woods Hole 1894

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