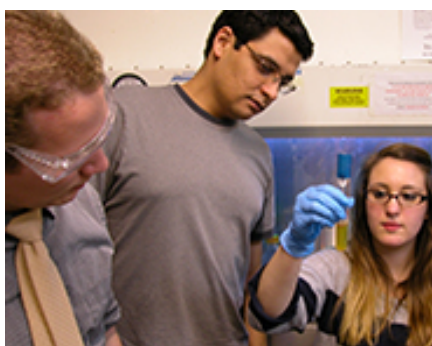




tackling today's world of environmental and medical challenges

Fall Community College Student Recruitment Has Started!



Applications are currently being accepted for [The Rose Hills Foundation Research Fellowship Program](#) at the Oak Crest Institute of Science. This internship program provides community college students with the unique and valuable opportunity to perform high-impact, independent research in [environmental science](#).

Two types of internship positions are available:

- 6-month internship: for students who DO plan to transfer to a 4-year school,
- 1-year internship: for students who DO NOT plan to transfer to a 4-year school; upon successful completion of the program, assistance will be provided to place you in a full-time research job.

To qualify, applicants must currently be enrolled at a local community college; be legally able to work in the U.S. and have completed general chemistry (organic chemistry or microbiology suggested).

Rose Hills Foundation Research Fellows receive a weekly stipend and are required to commit a minimum of 20 hours per week to their project for the duration of the program.

Deadline for applications is **Friday, November 6, 2015**. [Click here](#) for internship program details or email Sherry at s.tsai@oak-crest.org with your questions or application materials. All internships begin **Monday, December 14, 2015** with lab orientation and training workshops.

Researchers Explore Icy Worlds

News & Events

New Facility Update

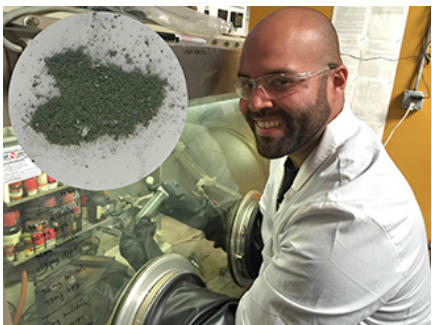
After several delays, construction is now in full swing at the new Oak Crest facility in Monrovia, CA. Carpenters, cement masons and roofers are hard at work retrofitting and reinforcing the newly joined buildings in preparation for the installation of new HVAC and solar equipment, as well as a cool roof membrane. Be sure to follow the exciting construction progress via our new [Blog](#).

Amgen Biotech Experience Kicks Off New School Year

The Amgen Biotech Experience program, directed by Oak Crest's Assistant Faculty Dr. Sherry Tsai, kicked off its new school year with its annual teachers' meetings. One meeting was held September 13 at Pierce College and another was held September 19 at Fullerton College. For the 2014-15 school year, the program served 24,522 students and 239 teachers at 143 schools. Oak Crest's [Dr. Sherry Tsai](#), Site Director for the Los Angeles area Amgen Biotech Experience, anticipates that number will grow even larger during the 2015-2016 school year.

In addition to attending the annual teachers' meetings, Dr. Tsai represented the greater Los Angeles site at the national

And Role of Green Rust



Former Rose Hills Fellow Vincent Aguirre Jr. analyzes samples of green rust in the Oak Crest lab while working on the NASA Icy Worlds astrobiology project.

In October 2014, [The Jet Propulsion Laboratory \(JPL\)](#) was awarded a NASA Astrobiology Institute Cooperative Agreement grant NNH13ZDA017C, entitled “ICY WORLDS: Astrobiology at the Rock-Water Interface and Beyond...” The five-year, \$8 million Icy Worlds program is led by Dr. Isik Kanik at JPL and consists of a [large prestigious team of scientists](#) from a wide range of institutions, including Oak Crest. The interdisciplinary Icy Worlds team is using a

mix of experimental, theoretical, and field-based research to answer one of the most compelling questions in astrobiology: How can geochemical disequilibria drive the emergence of prebiotic metabolism and ultimately generate observable geochemical signatures on icy worlds?

The program’s overarching objective is to demonstrate how physical and chemical gradients operating at the rock-water interfaces in icy world oceans can drive the redox chemistry that leads to early metabolic pathways, such as carbon dioxide reduction, nitrate-mediated methane oxidation, and the formation of amino acids. This work not only is relevant to early Earth, but potentially also to other, extraterrestrial icy bodies, such as Europa, Enceladus and Ganymede, in our Solar System. More information can be found at: <https://astrobiology.nasa.gov/nai/teams/can-7/jpl/>.

Work on this exciting new project at Oak Crest started in March, with former Rose Hills Fellow Vincent Aguirre Jr., mentored by Dr. Marc Baum. The project also dovetails with [The Rose Hills Fellowship](#) program, and two current researchers are currently investigating how different bacterial strains can lead to the formation of exotic minerals. One such mineral, “green rust” (GR), has been at the center of this research. GR is a highly redox-active, iron-containing layer double hydroxide (LDH) solid. In this sandwich-like structure, outer positively charged layers alternate with interlayer anions, leading to a net positive charge on the surface and the resulting ability to adsorb anions. This all leads to a diverse repertoire of possible chemical reactions that are being investigated by the Oak Crest team in close collaboration with JPL researchers.

“The Icy Worlds team is studying the habitability of icy worlds, including an investigation into how green rust might drive prebiotic chemistry, or chemistry that is a precursor to life,” says Dr. Laurie Barge, a planetary scientist at NASA’s Jet Propulsion Laboratory and visiting faculty at Oak Crest. “There’s a theory, developed by Dr. Michael Russell on our JPL Icy Worlds team, that green rust could have acted as a proto-enzyme to convert energy currencies on early Earth,” adds Dr. Barge, referring to how life forms convert proton and electron gradients into chemical energy to drive metabolism and, thereby life. “Nearly everywhere you look on Earth there is life, but we want to understand how life gets started so we can look for it on other worlds. And it’s looking like green rust could be a big part of the puzzle,” she adds.

OCIS and MADIA Tech Launch Announce “Ask a Scientist”

The Oak Crest Institute of Science and MADIA Tech Launch are pleased to introduce a new quarterly “science café” that will enable local scientists, researchers, entrepreneurs and community members to meet and discuss current and relevant scientific or technological topics side-by-side with some of the region’s leading researchers.

The “Ask a Scientist” series, which begins in December, will be casual, educational and entertaining. Each event will feature an expert speaker who will present a short 5-10 minute overview on a specific scientific topic. Audience members can then ask all those tough questions that

meeting of the Amgen Biotech Experience program held at the University of Rhode Island on September 21-22.

Seminars at Oak Crest

As part of their ongoing commitment to science education, Oak Crest hosts monthly seminars for their research fellows and volunteers on a variety of environmental and biomedical topics. Organized by Dr. Paul Webster, senior faculty at Oak Crest, recent seminars have included:

- Blaise Ndjamen, Ph.D. Caltech – “Antibody Bipolar Bridging in vitro model to characterize an Herpes virus immune system evasion mechanism.”
- Johanna Holm, Ph.D. USC – “The microbiome featuring the description of a novel photosynthetic protistian symbiont of local gorgonian octocorals, Muricea.”
- Andres Collazo, Ph.D. – “Introduction to Light Microscopy: from Leeuwenhoek to Super-Resolution.”
- Grayson Chadwick, Caltech – “Applications of stable isotope probing and microanalysis to microbial ecology.”

The next monthly seminar will be held November 4 at Oak Crest. Gustavo Ramirez, USC, will present “Marine Microbial Ecology Explored via in situ Osmotic Colonization Systems.”

Summer Research Programs at Oak Crest



This summer Oak Crest was alive with students and teachers from local high schools and community colleges who were given an opportunity to acquire skills and experience by conducting

curious minds want to know.

Held at various venues throughout the San Gabriel Valley, Ask a Scientist will be led by Oak Crest and provide an intimate setting and relaxed atmosphere where guests can engage in lively discussions, share ideas and ponder how future advancements in science and technology will affect the world we live in.

The inaugural Ask a Scientist event will be hosted by [MADIA Tech Launch](#) at their December 8 meet-up at Jake's Roadhouse, 622 S. Myrtle Ave., Monrovia, CA 91016, from 6:30 – 8:30 p.m. Dr. Marc Baum, Oak Crest President and Senior Faculty, will discuss "DNA Sequencing in Our Daily Life." The event is open to the public and is free of charge.

"The goal of this program is to instill an interest in science by inspiring individuals from all educational levels, career fields and walks of life to develop a deeper understanding of what underlies the world we live in," says Dr. Baum.

Upcoming topics include:

- Global HIV Prevention – Is the End of HIV Near?
- The Great Debate: What's Behind GMOs and Are They Safe?
- Better or Worse: Air Pollution in the South Coast Basin
- What Is a Bacterial Biofilm and Why Should You Care?
- That Gut Feeling – Probiotics Do They Work and Do They Have a Future?
- Planet – Heal Thy Self. A Look at the Medicinal Value of Natural Products
- The Link Between Chronic Infections and Bacterial Biofilms
- What Can the Human Microbiome Project Do For You?

"Oak Crest's collaboration with MADIA Tech Launch makes perfect sense," adds Dr. Baum. "As a career, company and industry incubator, MADIA's mission is to provide educational services to the region's technical, scientific and industrial workforce. This mission clearly complements Oak Crest's mission to train future scientists from a wide variety of backgrounds and educational levels," he adds. "Together, both organizations can increase awareness of the outstanding scientific and technological enterprises residing in the greater San Gabriel Valley."

Announcements regarding future Ask a Scientist events will be posted on the [Oak Crest website](#) as well as on Oak Crest's [Facebook](#) page. They will also be announced on [MADIA Tech's webpage](#) and on their [LinkedIn Group page](#).

Oak Crest Team Completes First Year of the NIH U19 Grant



Team members involved in the NIH U19 Program must meet in person at least once a year to present their research findings and discuss progress and challenges that they have encountered.

this groundbreaking research project.

Hosted by Principal Investigator, Dr. Marc Baum, president of the Oak Crest Institute of Science, the first IPCP [Annual Meeting](#) was held in mid-July in Pasadena, CA. The meeting brought together key personnel, Project and Core Leaders, and other stakeholders to review Year 1 activities on the grant project and to discuss activities to meet Year 2 specific aims.

mentored research in the exciting fields of microbiology, molecular biology and sustained release drug delivery.

Participants from local community colleges included three students from Citrus College as part of the college's STEM Summer Research Experience program. Four high school students from the Pasadena City College Math/Science Upward Bound program also took part in a "research class" at Oak Crest. The Upward Bound students conducted mentored research in learning microbiology and biotechnology techniques, three hours each day for a total of five weeks. Oak Crest's Senior Scientist [Manjula Gunawardana](#) supervised their research, which culminated in a seminar presentation on July 23 at Oak Crest.

Summer high school programs included the [Summer Research Connection](#) program, currently run by the Caltech Center for Teaching, Learning, and Outreach. The SRC was originally created by Oak Crest in 2008 in collaboration with the Caltech Classroom Connection. The SRC provides high school students and K-12 science teachers paid research internships at Caltech or Oak Crest. This past summer two high school students and one high school teacher participated in this program. The group conducted mentored research in anaerobic geomicrobiology and bacterial biofilm formation part-time at Oak Crest for 5 ½ weeks, culminating in a seminar presentation held at Caltech on July 31.

Oak Crest also hosted a high school teacher from Reseda High School for a two-week externship so she could learn about current science research and industry standards to take back to her classroom. Additionally, nearly a dozen high school and college students volunteered at Oak Crest throughout the summer and participated in projects which included analysis of solvent tolerance in bacteria, production of "green rust", a layer double hydroxide iron-containing mineral, formed by bacteria under anoxic conditions and isolation of genes expressing select enzymes from microbes living in asphalt.

Faculty Serves As Panelist for Girls Build LA Forum

[Dr. Sherry Tsai](#), Educational Outreach Director for the Oak

Researchers from Oak Crest were awarded the [\\$20 million grant](#) from the NIH in August 2014 to systematically develop an intravaginal ring capable of delivering potent antiretroviral drugs to prevent the spread of sexually transmitted HIV in women.

As part of the grant funding guidelines, team members involved in the NIH U19 Program must meet in person at least once a year to present their research findings and discuss progress and challenges that they have encountered during the past 12 months.

“This was truly a unique event,” said Dr. Baum. “Our young scientists at Oak Crest, many of whom have not even finished their college degrees, had the chance to converse with top notch researchers from some of the most prestigious institutions in the country. They were able to discuss groundbreaking advances in biomedical device development that are urgently needed to overcome inadequate disease treatment and prevention in the developing world. Where else would they have this type of amazing opportunity?” commented Dr. Baum.

Based on the success of this first meeting, preparations have already begun for the Second IPCP Annual Meeting which will be held April 27-29, 2016.

Crest Institute of Science, served as a panelist at the recent Girls Build Los Angeles Forum held at USC on October 27. More than 400 high school and middle school girls from Los Angeles attended the event.

The Girls Build LA Forum was held as part of the Girls Build LA Challenge (GBLA) where LA area girls will design and implement community-based solutions that can effect widespread change. GBLA empowers high school girls to highlight the challenges they face and provides them with resources and support to address them.

The Challenge is organized across three critical impact areas: Health & Wellness, Civic Engagement & Leadership, and STEM & College Access. As a panelist discussing the “STEM & College Access” impact area, Dr. Tsai discussed the myths around STEM careers and the importance of STEM education. She also provided advice to the students about attending college.

[friend on Facebook](#) | [forward to a friend](#)

Copyright © 2015 Oak Crest Institute of Science, All rights reserved.

Our mailing address is:
Oak Crest Institute of Science
2275 E. Foothill Blvd. Pasadena, CA 91107

|IF:REWARDS| *|HTML:REWARDS|* *|END:IF|*

Have a question? Contact our newsletter editor at news@oak-crest.org

[unsubscribe from this list](#) | [update subscription preferences](#)

ANNOUNCEMENTS

RESEARCH, PUBLICATIONS AND SPECIAL EVENTS

Ask a Scientist Forum – Tuesday, December 8, 6:30 – 8:30 p.m. Jake’s Roadhouse, 622 S. Myrtle Ave., Monrovia, CA 91016. Oak Crest President and Senior Faculty Dr. Marc Baum will discuss “DNA Sequencing in Our Daily Life.” This free event is hosted by [MADIA Tech Launch](#).

Congratulations to the following Oak Crest faculty and collaborators for the recent publication of their scientific papers:
[Baum, M.M.](#), Butkyavichene, I., [Churchman, S.A.](#), [Lopez, G.](#), [Miller, C.S.](#), [Smith, T.J.](#), [Moss, J.A.](#) [An intravaginal ring for the sustained delivery of tenofovir disoproxil fumarate. Int J Pharm.](#) 2015 Nov 10;495(1):579-87. doi: 10.1016/j.ijpharm.2015.09.028. Epub 2015 Sep 16.