
openlab
UCSC COLLABORATIVE RESEARCH

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FOSTERING INNOVATIVE COLLABORATIVE RESEARCH THROUGH EXPLORATION OF CULTURE & CREATIVITY AT THE UNIVERSITY OF CALIFORNIA SANTA CRUZ

The OpenLab Network is a new research initiative which targets a complex education issue of national significance regarding the ability of art and science researchers to collaborate on research endeavors. The goal of the OpenLab Network is to help change the current status by providing shared research facilities and create a network for collaborative discourse fueled by academic communities, arts and science communities, and industry.

The OpenLab Network project will pursue the physical development of new collaborative laboratories on campus as spaces to foster this research and establish an on-line social networking system for faculty and students to create projects. Laboratories and studios in both the arts and the sciences will be accessible to users in the OpenLab Network. Within this immersive environment, we will conduct research to acquire skills and knowledge that crosses disciplinary boundaries between science, education, and the arts while sharing expertise in collaborative research methodologies.

The following research questions will be investigated:

(1) How can we strengthen or create new methodologies that truly engage art and science thinking?

(2) Is an interdisciplinary laboratory space for cross-disciplinary and collaborative research more engaging and productive for students and faculty without these resources?

Facilities & Labs

OpenLab Research Projects Workspace/Casting Lab

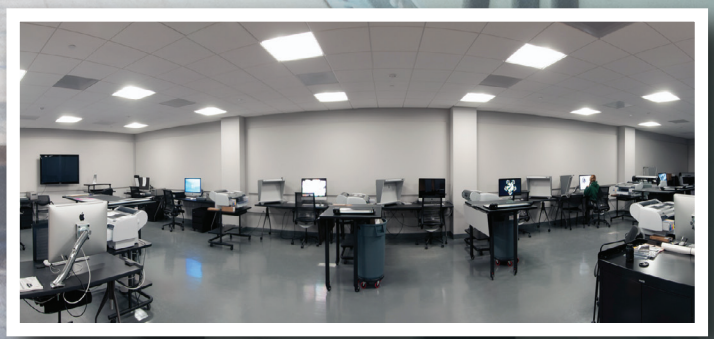
The casting lab, located behind the Theater Arts Center, near the Shakespeare Santa Cruz glen, is both a foundry and mold-making space. This shop supports sand and investment casting, plaster, wax, rubber, and silicone casting, as well as metal and plastic filing, sanding, and polishing.

Metal Fabrication Shop

The metal fabrication shop provides a multitude of machines and several welding stations. This shop facilitates a variety of welding processes including, TIG welding, MIG welding, Oxy-acetylene welding, and brazing.

Woodshop

Located at the Baskin Art Department, the woodshop supports all processes involving wood and acrylic. This shop is used for fine woodworking, large scale projects, small scale models and prototypes. This work area is equipped with large machines, hand tools, and ample workspace. Please click the link for detailed information on materials, hand tools, and equipment available in the wood shop.



Super Computer Lab

The Super Computer Lab for Undergraduates (SLUG), located in Thimann rm 339, is an ideal workspace for high-performance computing.

Photo Studio

At the Baskin Art Department, the photo studio is equipped with dozens of tripods, a variety of backdrops, softboxes, several pro heavy duty light stands, strobe lights, silver/white umbrellas, and monolights with flashtubes. This is space is perfect for documenting projects and photographing objects and/or people for web or print.

Print Studio

Located at the Baskin Art Department, in two large studios, the print lab accommodates lithography, intaglio, silkscreen, book making and digital printmaking.

Digital Imaging

Located on the first floor of the new Digital Arts Research Center (DARC), the digital imaging room is a gigantic, clean space for printing professional, digital images. equipped with twelve 27” imac computers with scanners, large format Epson Stylus Pro printers, and slide scanners. Each computer has Adobe CS5: Dreamweaver, Photoshop, Illustrator, Fireworks, Flash, & Bridge.

Education

To the Artist:
During the Renaissance, art was closely tied to science. These artist scientists saw no distinction between the disciplines. DaVinci explored imaginative machines while Filippo Brunelleschi concerned himself with perspective. Both were scientists and artists at once.

As we know, there was a split in this kind of thinking. Artists fought to create art 'for the sake of art'. The discipline was revolutionized by a plethora of new genres and ideas, studying and deconstructing art, asking the question: What exactly is art? Like science, it became known as an entity separated from whole systems thinking, removed from other areas of study. Art was reinvented, twisted around, re-represented, deconstructed, reconstructed, repackaged and refurbished. With the OpenLab Network project we hope to refuel connections between art and science by creating interdisciplinary spaces that re-integrate the hard and soft science with art into the realm interdisciplinary and collaborative research.

To the Scientist:

Science has become the backbone of our modern existence, yet most scientists behind the discoveries are isolated from all but their fellow researchers. Ideas that take so much money, time, dedication, and precision to achieve are siphoned into the market or lost in academic niches. Even then the discoveries are not fully appreciated as anything more than a problem that have enabled the latest iPhone app, the streamlining of some process, or a household appliance. The grandeur scientific discovery is reduced to convenience features.

These discoveries deserve to be celebrated by more than the educational elite. Researchers agree that new types of experimentation could be propelled by the scientific frontier, if the information were only accessible. Researchers in many fields are becoming aware that in order to do really creative work, they may need to go back to visual approaches once again. Very high level and creative achievement in the sciences has often come from the neurological resources linked to success in the arts.

Artists work to achieve variations in visual expression, and may at times strive for the viewer to experience the emotional turmoil embedded in the art form. The artists' tools of line, shape, form, contrast, color, scale, composition, and movement are manipulated in order to affect the emotions and, at its zenith, the passions in others. Because objectivity and reproducibility are the ultimate goals of scientific models, scientists and engineers who create and use these models rarely allude to this psychical process and hence effectively deny the motivation and inspiration behind this creative visual experience.

With science education and outreach being a requirement for all grants given out by NSF and many other scientific funding sources, the question then becomes how to effectively give this information to the masses. Public lectures, science museums, and non-technical publications most often engage an audience that has a pre-established interest in scientific disciplines, while failing to draw anyone else. Vocabulary can make the material seem dry, inapplicable, and abstract. The OpenLab network offers a new type of production for science education and outreach with the potential to reach a wider audience, while also offering the opportunity for new and exciting frontiers of interdisciplinary and collaborative research.

It is our hope that growth and productivity of interdisciplinary and collaborative research will increase exponentially through the use The OpenLab Network project sparking a grass-roots movement toward a more open, collaborative and experimental environment for those interested in interdisciplinary learning and research.

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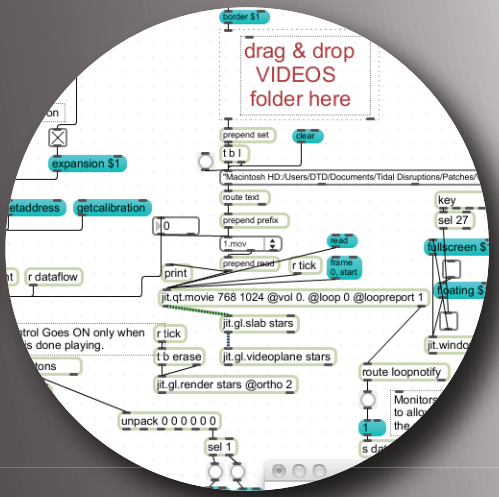
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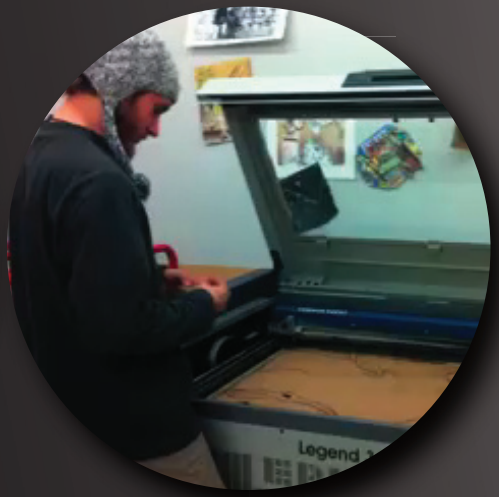
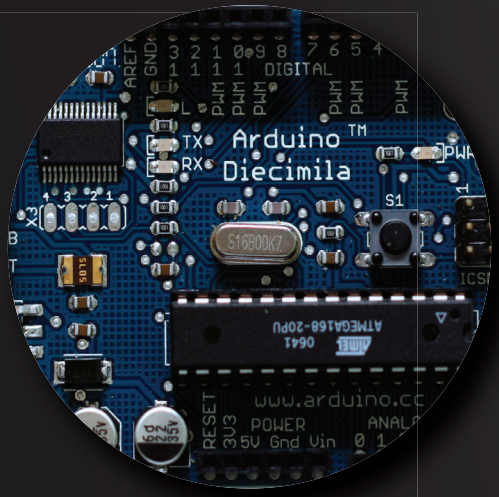


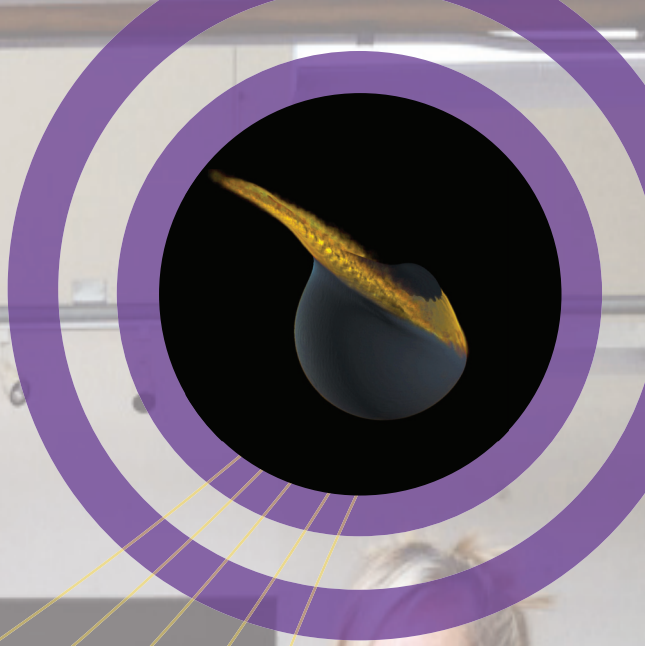

MakerBot
Thing-O-Matic
MakerBot
INDUSTRIES

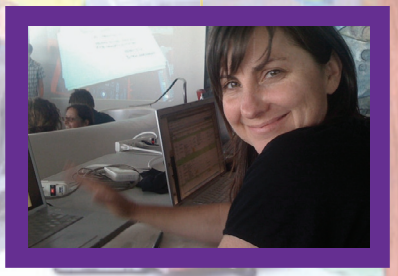

Arduino
Diecimila
TX
RX
DIGITAL
POWER
www.arduino.cc

Planetary Collisions & Materials

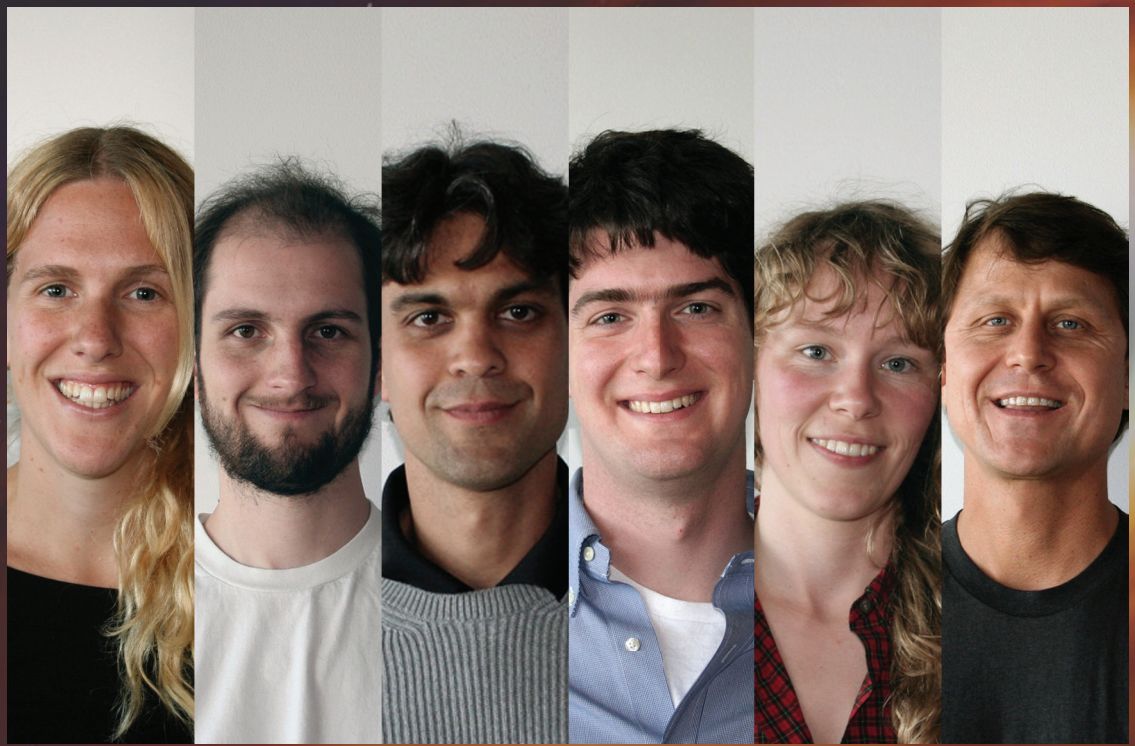
Sudu Terwari, DANM/Music Graduate student
Kayla Vuong, TASC Undergraduate CS/Engineering
Naor Movshovitz, Astrophysics Graduate Student
Jennifer Parker, DANM/Art Faculty
Erik Asphaug, Astrophysics & Earth Science Faculty
Leslie Thompson, Art Undergraduate
Bruce Kirk, Arts Staff Research Associate

Did Earth have two moons? According to Erik Asphaug at UCSC and Martin Jutzi at the University of Bern, Switzerland, a relatively late 'splat' by a sister moon caused the Moon's asymmetry. The far side highlands are massive and mountainous, with few volcanic areas, while the near side is dominated by maria (Latin for 'seas') -- dark basalts that have flooded low lying areas, forming the 'Man in the Moon'. According to computer simulations the sister moon went 'splat' and became a thick cold lid pasted onto one hemisphere of the Moon, shutting down volcanic activity on the far side, and pushing a deep igneous layer (colored yellow) onto the volcanically active near side. Is the far side really another planet? We've used colors to show contrast; the actual event would look like two dark, mountainous masses colliding in space over a couple of hours.



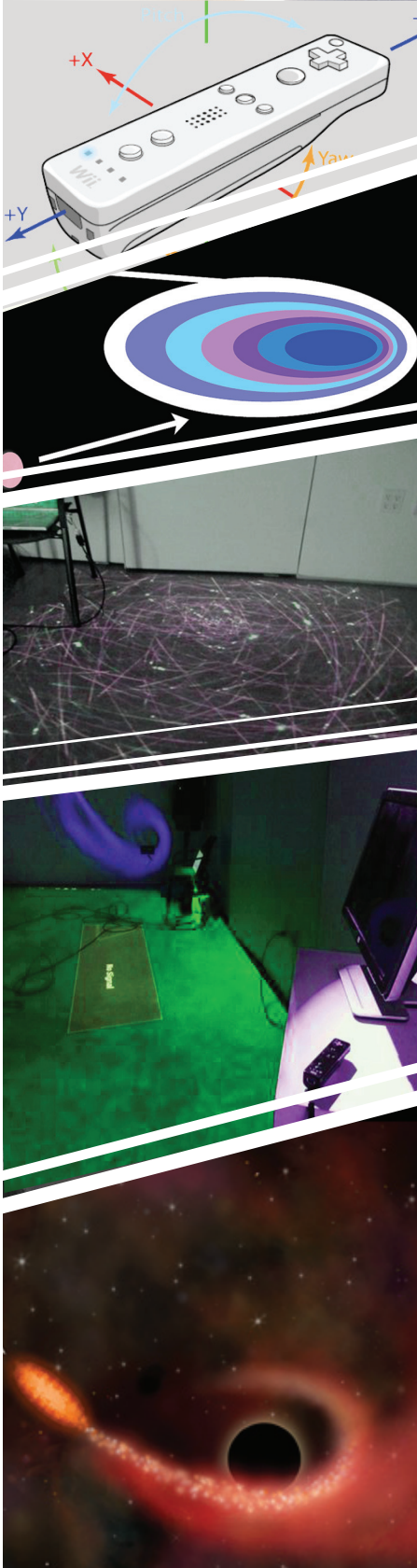


Tidal Disruption of Stars



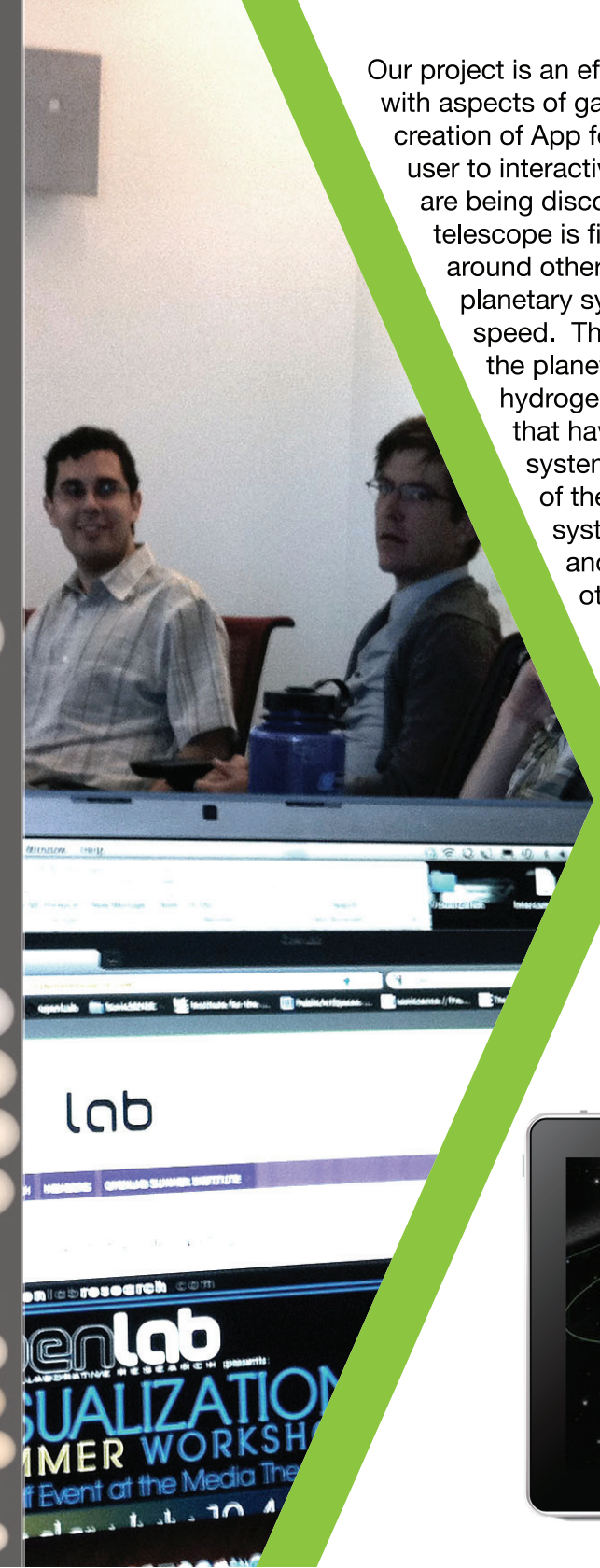
Jolie Ruelle, DANM Graduate Student/Summer Art Lecturer
James Guillochon, Astrophysics Graduate Student
Enrico Ramirez-Ruiz, Associate Professor, Astronomy & Astrophysics
Morgan MacLeod, Astrophysics Graduate Student
Nina Mccurdy, Astrophysics Research Associate
Drew Detweiler, DANM Research Associate

Enrico Ramirez-Ruiz, research focuses on the violent universe with an emphasis on stellar explosions, gamma-ray bursts, and accretion phenomena near compact objects. He did my graduate work at the Institute of Astronomy, University of Cambridge in England, where he was a member of Wolfson College. Before coming to Santa Cruz, he was a postdoctoral fellow at the Institute for Advanced Study in Princeton.

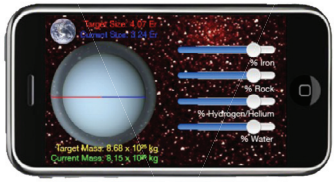


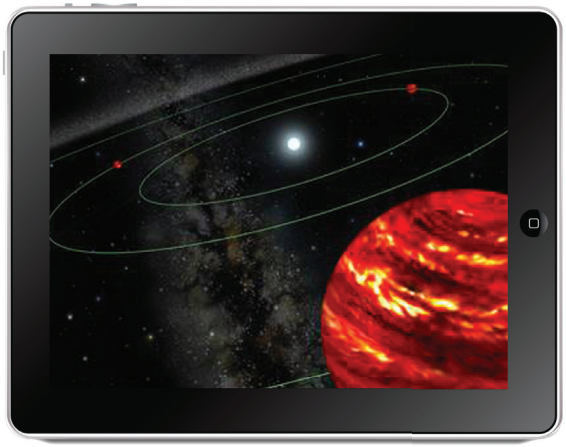
Extrasolarplanets

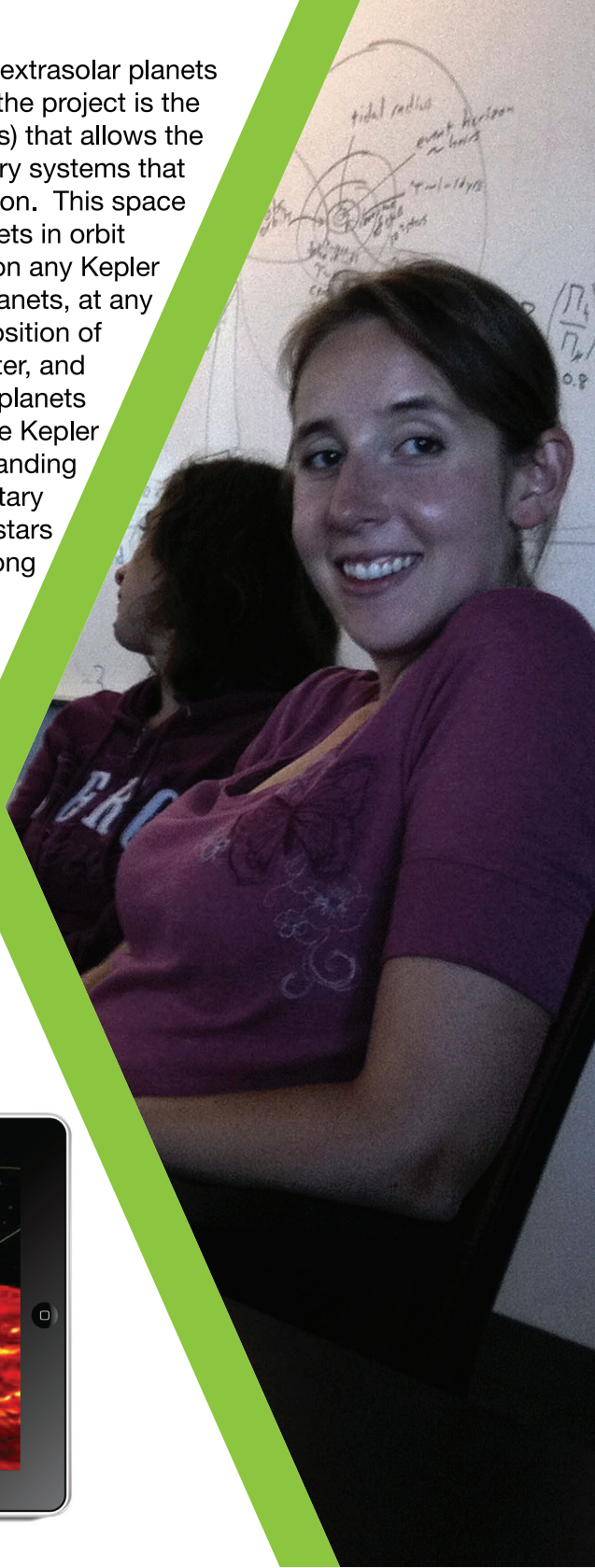
Caroline Morley, Astrophysics Graduate Student
John Peters, Games and Playable Media
Jonathan Fortney, Professor of Astrophysics
Kyle Mckinley, DANM Research Associate
Eric Lopez, Astrophysics Graduate Student



Our project is an effort to combine the science of extrasolar planets with aspects of game design. The main path of the project is the creation of App for the ipad (and other platforms) that allows the user to interactively explore the 1000+ planetary systems that are being discovered by NASA's Kepler Mission. This space telescope is finding rocky and gaseous planets in orbit around other stars. The user can zoom in on any Kepler planetary system and view the orbits of planets, at any speed. They can also explore the composition of the planets by combining iron, rock, water, and hydrogen/helium gas to "build" model planets that have the properties of those in the Kepler systems. The user gains an understanding of the incredibility diversity of planetary systems, the sizes of planets and stars and our solar system's place among others in the Milky Way galaxy.







GeneralAstronomy

Nathan Kandus, Art & Physics Lab

Claire Dorman, Astrophysics Graduate Student

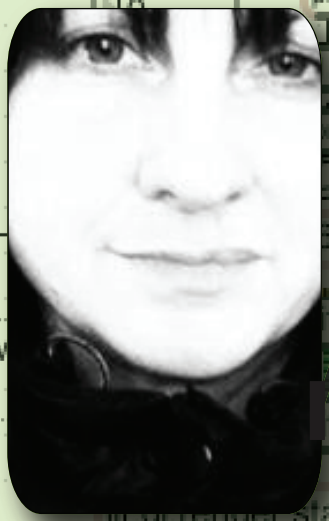
Raja Guhathakurta, Professor, Astronomy & Astrophysics

Lyes Belhocine, DANM Research Associate

Anahi Caldu Primo, Astrophysics Research Associate

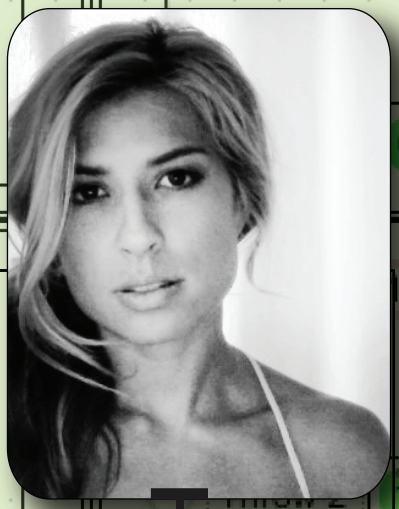
Raja Guhathakurta's research is focused on the formation and evolution of galaxies. One approach is the study of the local "fossil record". His group at UCSC has been leading the SPLASH survey of red giant stars in our closest large neighbor, the Andromeda spiral galaxy (M31; see image below). They have developed a sensitive method for identifying rare red giants in the remote outskirts of M31. Studies of stellar kinematics, chemical abundance, and age distribution are used to investigate the merger history of M31's halo, tidal disruption of dwarf satellites, the dark matter content of M31 and its satellites, and Local Group dynamics. A second approach is based on "direct look-back" to distant galaxies. With colleagues Faber and Koo at UCSC and Davis at UCB, we have recently completed the DEEP2 survey of 50,000 distant galaxies using the DEIMOS spectrograph on the Keck II telescope. An extension of this survey has been started in the Extended Groth Strip, and the spectra have been augmented by a truly panchromatic data set from the Chandra, GALEX, HST, and Spitzer telescopes to create AEGIS, the largest deeply imaged panchromatic region on the sky. Other research interests include interstellar dust grains and their interaction with radiation, stellar populations of globular clusters, and optical transients.

FounderBios



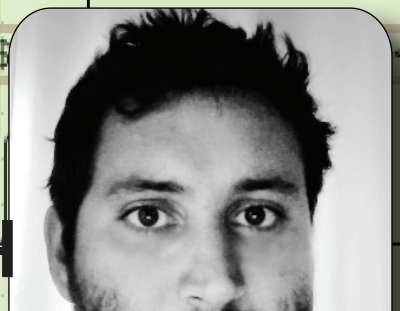
Jennifer Parker's sculptures, performances, and installations are inquiries into the essential nature of things. Parker's aesthetic might be dubbed unnatural naturalism. She employs a wide range of media to develop the limits of and context for her cultural practice. Underscoring her outlandish work is a rueful sense of the contemporary, urbanized mind unable to comprehend, and long out of touch with the forces of nature. For Parker, being an artist means being an activist, thinker, historian, and teacher who blends found objects, sound, and digital media with organic materials and traditional sculpture fabrication techniques to ask questions and to tell stories.

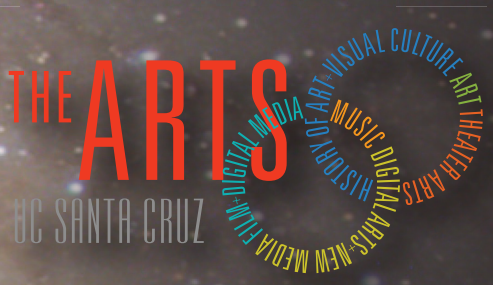
Enrico Ramirez-Ruiz, research focuses on the violent universe with an emphasis on stellar explosions, gamma-ray bursts, and accretion phenomena near compact objects. He did my graduate work at the Institute of Astronomy, University of Cambridge in England, where he was a member of Wolfson College. Before coming to Santa Cruz, he was a postdoctoral fellow at the Institute for Advanced Study in Princeton.

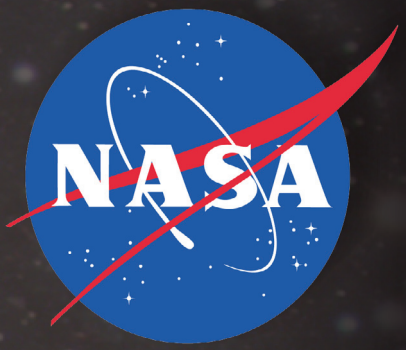


Amy Boewer's interests are in the exploration and process of manipulating space. She is deeply absorbed by the psychological and physical ways our bodies interact with environments. Her primary focus is to create installations that viewers' can enter and experience. By creating a container for the body, her work allows the viewer to discover the significance of the environment in relation to the body and movement. For Amy, her art exploration has no boundaries; she considers her art practice as research to discover new ways of thinking. She also enjoys graphic design, product prototyping, and sculpture.

Jack O'Neill's focus is in Business & Economics, and Digital Media. He creates projects and prototypes through art research using an interdisciplinary approach toward his experimentations. For Jack, art is his way of exploring the many possibilities of his ideas. He appreciates the do-it-youself, hands-on approach that the art community at UCSC employs.







ASTROPHYSICS
VISUALIZATION
LABORATORY