

An early frog embryo, imaged at high-resolution using surface imaging microscopy, a novel technique first applied to developmental biology in the Biological Imaging Center at Caltech. In this neurula-stage embryo, the archenteron (large cavity) has formed and the blastopore has closed, thus completing the major goals of gastrulation. Quantitative analytical techniques demonstrate that the cellular events of gastrulation are dissociable, providing a possible explanation for the observed diversity of gastrulation mechanisms among amphibians. The Director of the Biological Imaging Center is Scott Fraser, Anna L. Rosen Professor of Biology and Professor of Bioengineering.

This and related research is being carried out by members of the new BioDevices and Bioluminescence (BDBI) sub-option in Bioengineering at Caltech. The BDBI group develops technologies for manipulating and probing biological systems. Research areas include BioMEMS, laboratories-on-a-chip, microfluidic devices, molecular devices, medical devices (such as neural interfaces and micropumps), non-invasive biological and biomedical imaging, optical trapping and manipulation of molecules, and novel instrumentation and measurement principles. Visit <http://www.be.caltech.edu> for details.

In this issue of **ENGenious**, we offer a profile of the Mechanical Engineering Option as we celebrate the Centennial of Mechanical Engineering at Caltech this year. The Centennial is being marked by a Symposium on March 30–31, 2007. Caltech alumnus Tom Tyson (BS '54, PhD '67) and Professor Chris Brennen are serving as co-chairs of the event, and speakers include the president of Caltech, Jean-Lou Chameau, and the former president of the University of Michigan, James Duderstadt (MS '65, PhD '68). Talks by our alumni on electric cars, oil and gas exploration, nanomechanics for biological structures, and space exploration round out the program, with presentations by faculty and students as well. See <http://www.me100.caltech.edu> for details of this special event.

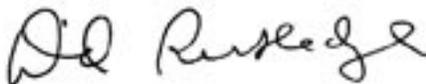
We are also very much looking forward to September, when we will hold an international conference celebrating 50 years of space technology hosted by the Graduate Aeronautical Laboratories (GALCIT), Northrop Grumman Space Technology, and NASA's Jet Propulsion Laboratory. Speakers include the president of Northrop Grumman Space Technology, Alexis Livanos (BS '70, MS '73, PhD '75), who we have interviewed in these pages; Charles Elachi, Director of JPL; Michael Griffin, Administrator of NASA; astronaut and Caltech Trustee Sally Ride; former U.S. Senator and astronaut Harrison Schmitt (BS '57); and John Mather, 2006 Nobel Laureate. Visit <http://www.galcit.caltech.edu/space50> for more information.

The continuing generosity of the Gordon and Betty Moore Foundation is evident by the recent establishment of the Caltech Center for Sustainable Energy Research (CCSER). This Center has the goal of replacing fossil fuel as an energy source. In an interview, the principal faculty members, led by Professor Harry Atwater, describe the scientific goals and the challenges.

This issue of **ENGenious** also reports on lensless microscopes, floating DNA circuits, the evolution of the Sherman Fairchild Library in the era of digital publishing, and the expanding possibilities for collaborations between the Division and the Jet Propulsion Laboratory.

In many ways, we are who we hire. I am happy to introduce eight new faculty members to you in these pages—as well as announce that there are currently nine active faculty search committees operating on behalf of the Division.

As always, we welcome your feedback, and we hope you will visit us when you are in the area.



**DAVID B. RUTLEDGE**

Chair, Division of Engineering and Applied Science

