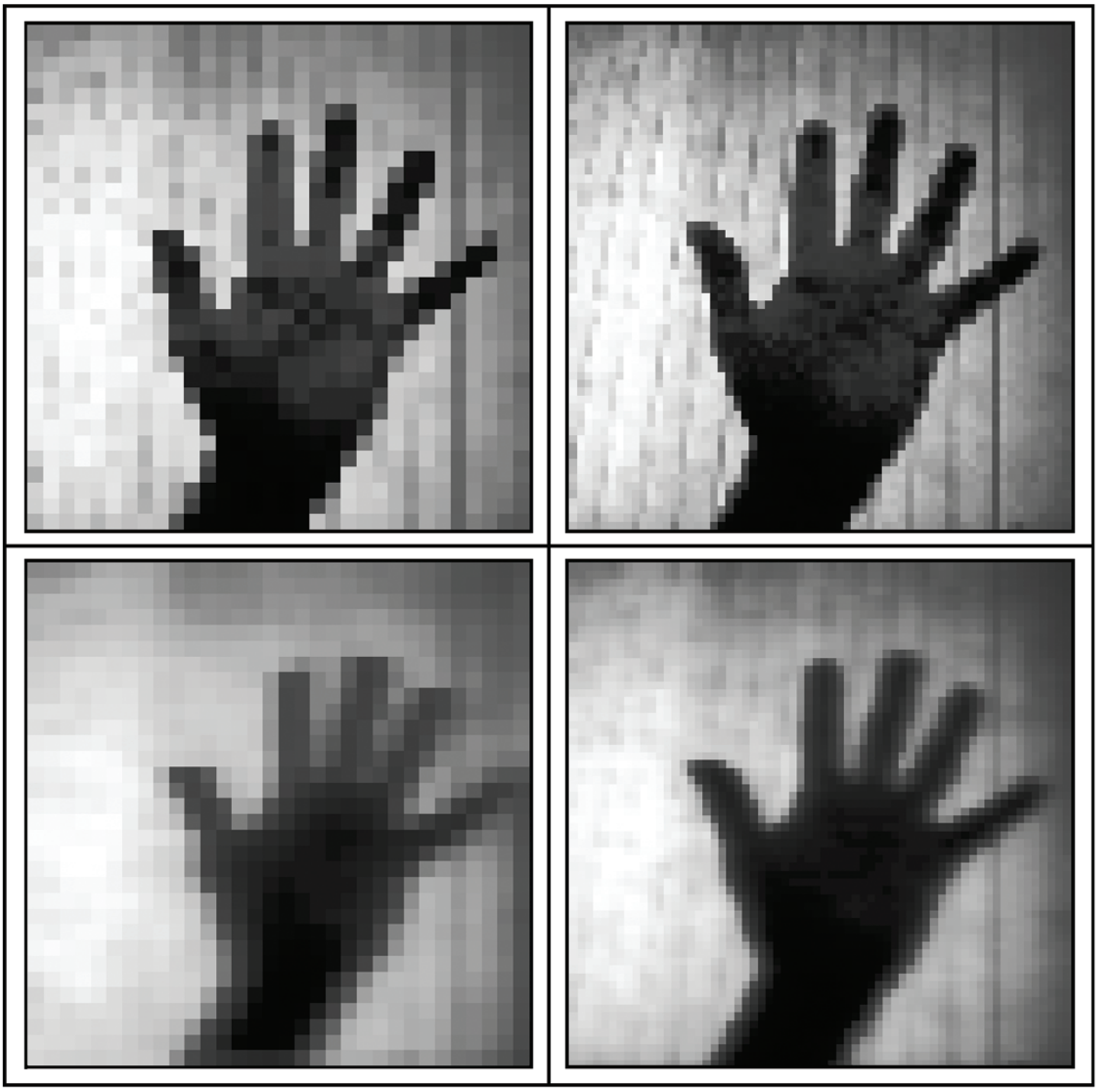


Upper left: visual perception with a 32 x 32 electrode array retinal implant. Upper right: visual perception with a 64 x 64 electrode array retinal implant. Lower left: visual perception with a 32 x 32 electrode array retinal implant with blur. Lower right: visual perception with a 64 x 64 electrode array retinal implant with blur. Generated with *Artificial Vision Simulator* developed by Dr. Wolfgang Fink, Caltech Visiting Associate in Physics. See page 20 for a Research Note from Professor Yu-Chong Tai and Dr. Fink on retinal implant technology and the possibility of restoring vision to people who have lost photoreceptor function.

NOTE FROM THE CHAIR

In each issue of **ENGenious** *we like to feature one of the academic options, and this time the Electrical Engineering option has stepped forward to share with you a glimpse of recent research activities. I have to say,* this is not your father's EE, *as the phrase goes. The variety of research is astonishing, and embraces phenomena from genomics to computational finance, alongside traditional areas such as communications and signal processing. But even "traditional" areas here are always at the cutting edge, as will be evident.*

There is also a focus on prostheses in this issue. Joel Burdick and Richard Andersen present their work on the world's first cognitive neural prosthesis, which allows the direction of a physical activity (in this case, computer cursor movement) by pure thought alone. Yu-Chong Tai and Wolfgang Fink report on their work in creating a retinal prosthesis, which takes advantage of "smart skin" invented in the Tai lab.

The Institute's capital campaign, "There's only one. Caltech," is in full swing and it gives me great pleasure to announce four tremendous gifts which will transform the research and education in the Division for decades to come.

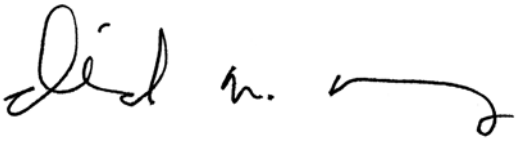
The first two are in support of Caltech's Nanoscience Initiative, which ultimately seeks to develop integrated nanoscale systems that will lead to true nanoscale technology. Caltech scientists and engineers have been working in the trenches of the nano world for more than a decade. Recognizing the maturity of our on-going efforts in the field, the Gordon and Betty Moore Foundation has granted us $25.4 million to reach this next level. Integrated nanoscale systems are only possible through a new collaborative science that transcends what individual laboratories can attempt, and the state-of-the-art infrastructure and equipment that the Moore gift allows us to implement will be unprecedented in the research community. Similarly, Fred Kavli and the Kavli Foundation awarded a $7.5 million grant to Caltech in March to establish the Kavli Nanoscience Institute (KNI). Under the direction of Michael Roukes, Professor of Physics, Applied Physics, and Bioengineering, the KNI will allow us to co-locate many of the disparate groups on campus and create a formal home for the nanoscience community at Caltech.

The Division's research thrust into Information Science and Technology (IST), described in these pages previously, has received a huge endorsement in the form of two outstanding gifts: the first is $25 million from the Annenberg Foundation. The second is $22 million from the Gordon and Betty Moore Foundation. I invite you to turn the page to read more on how these gifts will be used to formally establish the nation's intellectual and academic center for information science.

These gifts are inspiring, and will change the lives of many—from our students and faculty to all the persons who will eventually be touched by the life-enriching and life-saving technologies that will grow from these magnanimous seeds.

As always, we welcome your feedback.

Sincerely,



RICHARD M. MURRAY
Chair, Division of Engineering and Applied Science