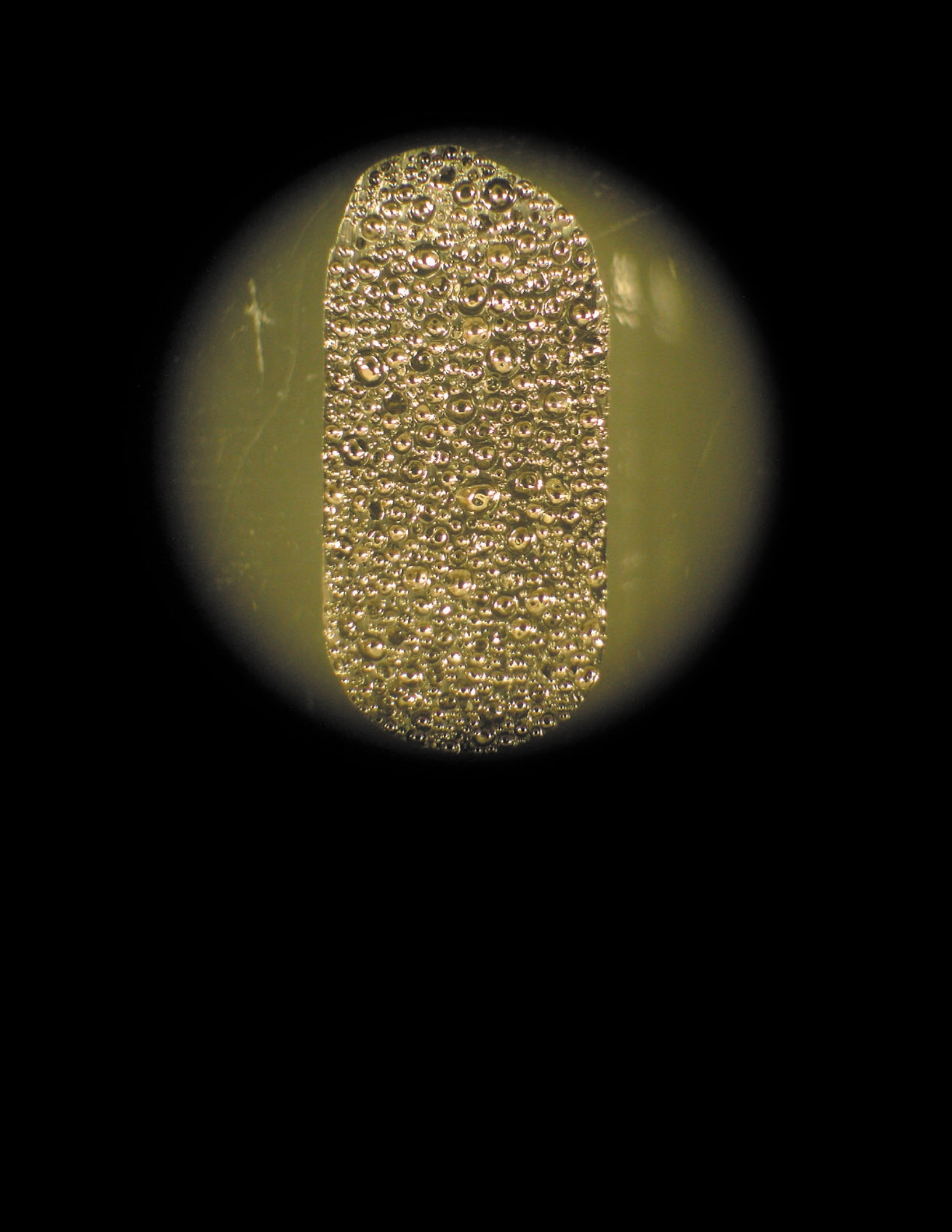


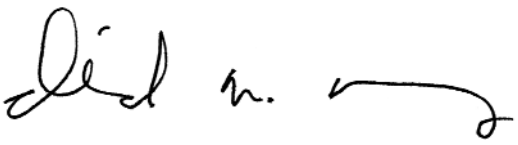
NOTE FROM THE CHAIR

The Graduate Aeronautical Laboratories of the California Institute of Technology—of course we all know this as GALCIT—is celebrating 75 astonishing years on November 14 and 15th. **ENGenious** *is joining the celebration by featuring the GALCIT faculty in this issue. They muse on the characteristics that have made GALCIT unique, and give a glimpse of current and near-term research. It's not too late to join the festivities yourself. If you are an aeronautics alum, a Caltech alum with fond memories of GALCIT, or an interested friend of the Institute, please visit the event website* www.galcit.caltech.edu/galcit75 *to find the details of the program, see who will be there, and register. It will be a good mix of social activities and technical updates, and I look forward to seeing you there.*

Also in this issue we visit my home option, Control and Dynamical Systems, and have the opportunity to learn more about the details of Steven Low's efforts to change the very nature of internet transmission protocols and Moore Scholar Bernard Yurke's work with Erik Winfree and Michael Roukes to continue filling "the nano toolbox."

I attended the East Coast campaign kick-off gala last month in New York City, and was pleased to see so many alumni and friends of the Institute eager to hear about the remarkable things happening on campus. Caltech has reached an impressive 62 percent of its campaign goal of $1.4 billion through the vision and generosity of many people. This issue of **ENGenious**, *from cover to cover, reflects the outstanding acheivements that are possible when committed students, faculty, alumni, and friends of the Institute work together in the name of excellence.*

Sincerely,



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

Image at left: A micrograph of "bubbloy," an amorphous, homogeneous foam of bulk metallic glass (BMG) $Pd_{43}Ni_{10}Cu_{27}P_{20}$. The foaming of metals is a challenge since foam is an unstable structure. However, metallic foams are known to have many interesting properties, offering high stiffness in conjunction with very low specific weight, high gas permeability, high thermal conductivity, and especially, high energy absorption capability. Dr. Jan Schroers, a recent post-doctoral scholar in Professor William Johnson's lab, along with graduate student Chris Veazey, invented a method to foam bulk metallic glass. Since the amount of energy that can be absorbed scales with the strength of a material, and since BMGs exhibit a yield strength of about 2 GPa (compared to 250 MPa for aluminum), a very large energy absorption ability is expected from BMG foams. Projected practical applications include possible use in the crumple zones of autos, for instance. This work in still in early developmental stages, but it has already moved into a Caltech spin-off company called Liquidmetal Technologies.