



This booklet has been created to highlight and celebrate the accomplishments of the Lee Center for Advanced Networking, founded in 1999. It also serves as a thank you to Dr. David Lee whose vision and generosity made the Lee Center for Advanced Networking at the California Institute of Technology a reality.

David Lee wanted the Lee Center to support a distinctive class of research projects that are smaller and higher risk. “I wanted to give these scientists more flexibility, and allow them to explore where their research takes them.” This philosophy inspired the research conducted by the members of the Lee Center.

In regard to this booklet, I would like to thank the interdisciplinary group of faculty and researchers for their contributions; as well as Kerry Vahala, the current director of the Lee Center, and David Rutledge, the past director, for their research vision, leadership, and service. Finally, I would also like to express our gratitude to Richard (Dick) Edmiston for his guidance and advice to the Lee Center; and to Charles Wheatley for support of the yearly workshop.



Ares Rosakis
Chair, Division of Engineering
and Applied Science

The Lee Center is the vision of Caltech graduate and venture capitalist, David Lee, whose David and Ellen Lee Foundation donated \$10 million to establish a center for networking research over a ten-year period. Rather than support a specific single program, Lee intended the Center's researchers to have free rein "to start a lot of little projects" under the broad theme of networks. Moreover, the center, by design, would allow "people with different areas of expertise to mix together," and thereby create new synergies for research. Finally, the center would provide a powerful recruiting tool to attract the best and brightest faculty hires to Caltech.

In a time when funding for research has become ever more focused and conservative in scope, the Lee Center has created opportunities to explore those highest risk ideas that are most difficult to support, but for which the impact can be greatest. In doing so, it has had a far ranging impact on Caltech and research in general.

Its core research mission has resulted in hundreds of peer-reviewed publications spanning devices, systems and networks. In addition, the center has provided a focus to cross-fertilize traditionally disparate subject areas. Its biweekly faculty seminar lunch has brought together a diverse group of researchers; and the Lee center yearly workshop has served to summarize and regularly review progress. Through these center-sponsored interactions, new research initiatives have been inspired, such as the Information Science and Technology Initiative (IST), now located in the newly built Annenberg building. Also, research synergies have been identified, and have enabled breakthroughs such as high-frequency, CMOS power circuits for wireless systems. Moreover, several startup companies have strong ties with member groups or have derived their technology inspiration from center-funded research.

The possibility of membership in the Lee center has helped in recruiting some seven new professors; and financial support from the center has accelerated their research-program startup process. At the same time, their interaction with other members from different disciplines has provided opportunities to open new research vistas. The Lee Center has also helped to support campus projects such as the DARPA grand challenge, faculty visits from other research institutions, interactions with industry; and even projects to create local wireless hotspots on campus, long before there was a campus-wide wireless network.

Both the ten-year lifespan and support level of the Lee Center are comparable to certain National Science Foundation centers (MRSEC or STC). However, these government-funded centers tend to be conservative in their scope, and focus on established research topics so as to gain both recognition and traction within the peer review system. In contrast, the Lee Center targets and literally seeds truly exploratory work. Successful projects within the Lee Center lead to much larger efforts that could become government sponsored initiatives or company startups, thereby greatly leveraging center dollars.

In summary, the Center has been a tremendous success. David Lee's idea to enable free rein "to start a lot of little projects" fills a crucial gap in how science is supported; and when combined with the breadth of the center's research scope this has enabled a range of important outcomes and synergies even beyond the support of research itself.

The impact of the Lee center is documented primarily through the online record of all center-supported publications; and is available at the Lee center website. However, faculty appointments, ongoing research initiatives, breakthroughs that have launched startup companies, and scientific collaborations both inside and outside Caltech also provide testament to its impact.

This booklet gives a brief account of the Center's accomplishments. It is organized into two parts. The first section describes research results in the words of the center members themselves; and a second section describes some, but not all, of the other areas of impact. It is our hope that David Lee's vision can serve as a model for the funding of future research at Caltech.



Kerry Vahala
Director, 2007-2010



David Rutledge
Director, 2000-2006