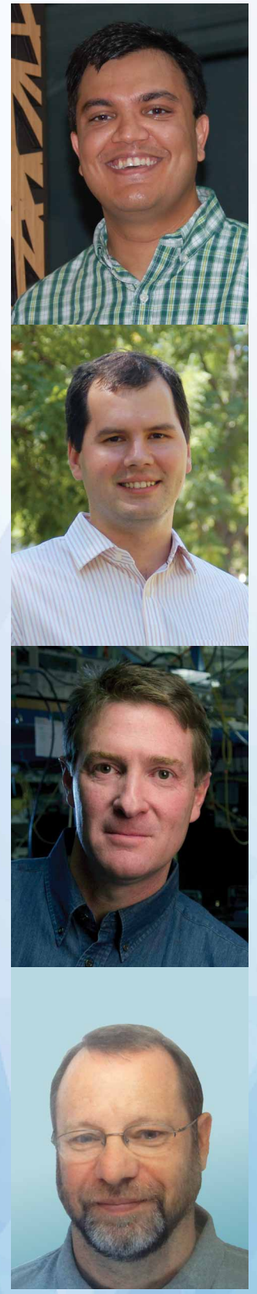
WHO'S NEW



Top to bottom:
Venkat Chandrasekaran; Andrei Faraon; Scott Diddams; Peter Schmid

New Faculty

Venkat Chandrasekaran
Assistant Professor of Computing and Mathematical Sciences

Venkat Chandrasekaran's research interests lie in mathematical optimization and its application to problems in the information sciences. His recent contributions include computationally efficient methods for learning latent variables in statistical models and techniques for solving a broad range of inverse problems that arise in scientific disciplines. A central theme in these approaches is the prominent role played by convex geometry in high dimensions. Current efforts are focused on developing algorithms for processing massive amounts of data, with the upshot being that larger datasets are more efficient to process than smaller ones.

Chandrasekaran received his PhD in electrical engineering and computer science from the Massachusetts Institute of Technology (MIT) in 2011 and his undergraduate degrees in mathematics and in electrical and computer engineering from Rice University in 2005. He has been a postdoctoral fellow at the University of California, Berkeley, where he worked on statistical inference problems involving massive datasets. He has also been a visiting researcher at the Los Alamos National Laboratory, where he was part of the Center for Nonlinear Studies in the Theoretical Division, working on problems at the intersection of statistical physics and machine learning. He received the 2012 Jin-Au Kong Outstanding Doctoral Thesis Prize in electrical engineering at MIT for his dissertation.

Andrei Faraon
Assistant Professor of Applied Physics and Materials Science

Andrei Faraon is interested in developing nanophotonic quantum technologies for devices that operate close to the fundamental limit of light-matter interaction. Applications include on-chip optical signal processing at ultra-low power levels, energy-efficient sensors, biophotonics, and quantum information processing. The development of nanophotonic quantum devices in the Faraon lab involves a design phase based on nanoscale classical and quantum optics, nanofabrication that pushes the limits of state-of-the-art cleanroom equipment, and optical characterization at the single photon level.

Faraon received his BS in physics from Caltech in 2004. He then moved to Stanford for a PhD in applied physics and an MS in electrical engineering, both of which he received in 2009. His PhD research focused on developing integrated photonic crystal devices with coupled quantum dots for classical and quantum information processing. Following his PhD, he became a postdoctoral fellow in the Intelligent Infrastructure Lab at Hewlett-Packard (HP) Laboratories in Palo Alto, California. At HP, he developed photonic quantum technologies based on nitrogen vacancies in diamond and built optical interconnect devices in silicon. Faraon received the Ross Tucker Award in 2008 for advancement of the technology of materials used in semiconductor electronics. He has published over 25 journal articles and coauthored three book chapters.

Moore Scholars

The Moore Distinguished Scholars program was established by Gordon and Betty Moore to invite researchers of exceptional quality who are distinguished at both the national and international levels to visit the California Institute of Technology for three to six months. There are no teaching or other obligations during the appointment, allowing Moore Scholars to focus on research.

Scott Diddams
Physicist and Project Leader, National Institute of Standards and Technology

Scott Diddams is an experimental physicist working in the fields of precision spectroscopy and metrology, nonlinear optics, and ultrafast lasers. Since 2000, Diddams has been a staff member and project leader at the National Institute of Standards and Technology (NIST). His work focuses on the development of optical frequency combs, and he has pioneered their use in optical clocks, tests of fundamental physics, novel spectroscopy in the visible and mid-infrared, precision metrology, and ultralow noise frequency synthesis. Diddams received his PhD from the University of New Mexico in 1996. From 1996 through 2000, he did postdoctoral work at JILA, a joint institute of the University of Colorado at Boulder and NIST. In 1998, Diddams was awarded a National Research Council fellowship to work at JILA with Dr. John Lewis Hall on the development and use of optical frequency combs. With JILA colleagues, he built the first self-referenced, octave-spanning optical frequency comb and used it to demonstrate carrier-envelope phase stabilized pulses, as well as carry out direct optical-to-microwave measurements. Diddams is also a recipient of the Department of Commerce gold and silver medals for "revolutionizing the way frequency is measured" as well as the Presidential Early Career Award in Science and Engineering (PECASE) for his work on optical frequency combs. He is a Fellow of the Optical Society of America and the American Physical Society.

Peter Schmid
Research Director, French National Research Agency; Professor of Mechanics, École Polytechnique

Peter Schmid's research interests lie in computational fluid dynamics, in particular in hydrodynamic stability theory and flow control. His current efforts focus on the description and targeted manipulation of flow behavior in complex geometries. Applications range from control of instabilities to suppression of noise amplification, from techniques for mixing enhancement to designs with reduced flow sensitivities. The tools to accomplish these objectives originate from control theory, model reduction algorithms, system identification techniques, iterative linear algebra, and optimization. In addition, he is interested in quantitative flow analysis and the extraction of coherent flow structures from experimental or numerical data sequences, including their use in low-order representations for control purposes.

Schmid is currently a research director with the French National Research Agency (CNRS) and Professor of Mechanics at the École Polytechnique in Paris. Previously, he held a faculty position in applied mathematics at the University of Washington in Seattle. He is a Fellow of the American Physical Society, an Overseas Fellow of Churchill College (Cambridge University), and the recipient of the French "Chaire d'excellence" award and the Alexander von Humboldt Research Fellowship. He received his PhD in mathematics from MIT and his engineer's degree in aeronautics and astronautics from the Technical University Munich.