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Dionne is an assistant professor in the Department of Materials Science and Engineering at Stanford University. She received her PhD degree in applied physics in 2009 at the California Institute of Technology, advised by Professor Harry Atwater. In 2010, she served as a postdoctoral research fellow in chemistry at the University of CA–Berkeley, and the Lawrence Berkeley National

Laboratory, advised by Professor Paul Alivisatos. She received the Washington University Young Alumnus Award from her undergraduate alma mater and has also received the NSF CAREER Award, AFOSR Young Investigator Award, Technology Review Top Young Innovator Award, Hellman Fellowship, Terman Fellowship, Clauser Prize for Best Caltech Thesis, and MRS Gold Medal Graduate Student Award.



Harry A. Atwater

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Atwater is a Howard Hughes Professor and professor of applied physics and materials science at the California Institute of Technology. Atwater received his SB (1981), SM (1983), and PhD (1987) degrees in electrical engineering from the Massachusetts Institute of Technology. He currently serves as director of the DOE Energy

Frontier Research Center on Light-Material Interactions in Solar Energy Conversion and was recently named Director of the Resnick Institute for Science, Energy and Sustainability. Atwater is founder and chief technical advisor for Alta Devices and Aonex Corporation. He is an MRS Fellow and past MRS President and has been honored by many awards, including the 2012 ENI Award for Renewable and Non-Conventional Energy, MRS Kavli Lecturer in Nanoscience, Popular Mechanics Breakthrough Award, Joop Los Fellowship from the Dutch Society for Fundamental Research on Matter, AT&T Foundation Award, NSF Presidential Young Investigator Award, and IBM Faculty Development Award.



Javier Aizpurua

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Aizpurua is a tenured scientist at the Center for Materials Physics of the Spanish National Council for Scientific Research (CSIC) in San Sebastián, Spain, where he is leading a group devoted to the theory of nanophotonics. For many years he studied the theoretical excitation of surface plasmons in different configurations such as in tunneling microscopy, in electron microscopy, or in near-field optical microscopy.

He currently develops theories and methods to study quantum effects in plasmonics and the general interplay of electromagnetic interactions of hybrid optoelectronic systems in the nanoscale.



Philip E. Batson

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Batson is a research professor at the Institute for Advanced Materials, Devices and Nanotechnology, with appointments in Physics and Astronomy, and Materials Science at Rutgers University. He is retired from the IBM Thomas J. Watson Research Center, where he pioneered spatially resolved electron energy-loss spectroscopy in STEM, with studies of surface plasmon scattering in metal nanoparticle systems. He

was also the first to demonstrate sub-Angstrom resolution using aberration correction optics, and he is currently using this capability to investigate plasmonic forces in nanometer-sized metal particles.



Alexandra Boltasseva

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Boltasseva is an assistant professor in the School of Electrical and Computer Engineering and Birck Nanotechnology Center, Purdue University, and an adjunct associate professor in the Technical University of Denmark (DTU). She received her PhD degree in electrical engineering at DTU in 2004. Alexandra specializes in nanophotonics, nanofabrication, plasmonics, and metamaterials.

She received the Young Elite-Researcher Award from the Danish Council for Independent Research in 2008, the Young Researcher Award in Advanced Optical Technologies from the University of Erlangen-Nuremberg in Germany in 2009, and the Technology Review Top Young Innovator Award TR35 Award in 2011. She is a topical editor for *Optics Letters* and the *Journal of Optics*, a senior member of the OSA, and a member of IEEE, SPIE, and MRS.



Toon Coenen

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Coenen studied chemistry and physics at the University of Utrecht, where he graduated in 2010 after doing research at the FOM Institute AMOLF in Amsterdam on the development of angle-resolved cathodoluminescence spectroscopy. He is currently working as a graduate student at AMOLF. His studies focus on the optical properties of metallic and dielectric nanostructures using cathodoluminescence spectroscopy.



Zubin Jacob

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Jacob is an assistant professor of ECE at the University of Alberta, Canada. Prior to that, he completed his PhD degree at Purdue University (2010), where he received the Dmitri N. Chorafas Best Dissertation Prize for his work on classical and quantum optics of hyperbolic metamaterials. He completed his MAEE (2006) and MSEE (2007) from Princeton University and a B.Tech in electrical engineering (2004) from

the Indian Institute of Technology–Bombay, India. He has received many awards for his research, including the SPIE Graduate Fellowship Award for potential long range contributions to optics and optical engineering (2008) and the IEEE Photonics Society Fellowship (2010).



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Khurgin has been a professor of electrical and computer engineering at Johns Hopkins University since 1988. Prior to that, he was a senior member of the research staff at Philips NV, where he developed various display components and systems. Khurgin's main area of expertise is in optical and electronic solid-state devices.

He has made important contributions in the fields

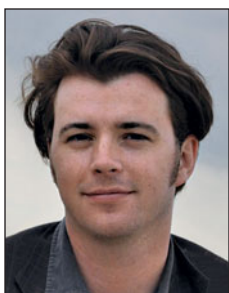
of nonlinear optics, semiconductor optoelectronic devices, quantum-cascade lasers, optical communications, THz technology, slow light, plasmonics, and fundamental condensed matter physics. He is a fellow of the American Physical Society and Optical Society of America.



Ren-Min Ma

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Ma received his PhD degree in physics from Peking University, China, in 2009. His dissertation focused on semiconductor physics and devices in low dimensional structures, and he received the National Top 100 PhD dissertations of China Award. He has been a postdoctoral scholar at UC Berkeley since 2009. His current research interests include nanoscale materials, optics, and photonics.



Rupert F. Oulton

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Oulton is a UK Engineering and Physical Sciences Research Council Fellow and Leverhulme Lecturer at Imperial College London since 2010. He graduated with a PhD degree in physics from Imperial College London studying the physics of wavelength scale semiconductor optical devices and went on to study plasmonics and metamaterials at UC Berkeley as a research associate. His current research interests include

the linear and nonlinear optics of metallic nanostructures, metal-based lasers, and quantum optics.



Albert Polman

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Polman obtained his PhD degree from the University of Utrecht in 1989. He was a postdoctoral researcher at AT&T Bell Laboratories until 1991 and then became group leader at the FOM Institute AMOLF in Amsterdam. Since 2006, he also serves as director of AMOLF. Polman's research focuses on nanophotonics: the control, understanding, and application of light used at the nanoscale, with special emphasis on light management in solar cells and optical

metamaterials. Polman is a member of the Royal Netherlands Academy of Arts and Sciences, Fellow of the Materials Research Society, and recipient of an ERC Advanced Investigator Grant (2010).



Romain Quidant

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Quidant received his PhD degree in physics in 2002 from the University of Dijon in France. Since then he has worked in Barcelona at ICFO in the field of plasmonics. In 2006, he was appointed as junior professor and group leader of the plasmon nano-optics group. In 2009, he became a tenured professor at ICFO and ICREA. In 2010, he received a Starting Grant from the European Research Council (ERC). His scientific

achievements have been acknowledged by several prizes, including the Fresnel prize from the European Physics Society (2009), the prize of the city of Barcelona (2010), and the IMPULSA Prize from the Fundació príncep de Girona (2011). Since January 2010, he serves as the coordinator of the European FP7-STREP project "SPEDOC."



Alejandro Reyes-Coronado

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Reyes-Coronado obtained his PhD degree from the Institute of Physics at the National Autonomous University of Mexico, after two postdoctoral research stays (first at the Donostia International Physics Center, working in the field of nanoplasmonics and forces induced on metallic nanoparticles by swift electrons, and second at the Institute of Electronic Structure and Laser, at the Foundation for Research and

Technology–Hellas, working in the field of self-assembly polaritonic metamaterials). Reyes-Coronado is currently working as a full-time researcher at the Institute of Physics at the Autonomous University of Puebla, Mexico.



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Sorger is an assistant professor in the Department of Electrical and Computer Engineering at the George Washington University in Washington, DC. He received his PhD and MS degrees from the University of California–Berkeley and the University of Texas at Austin, respectively, where he conducted research in the fields of nanoscale opto-electronics and novel materials exploration. Current research areas include enhanced light-

matter-interactions, opto-electronics, silicon photonics, plasmonics, novel materials, and solar-to-energy conversion. Sorger received the MRS Gold Medal Graduate Student Award, the Intel PhD Fellowship, the BACUS and SPIE scholarship, and was nominated by the US Advisory Committee to the International Commission of Optics for the best student paper in 2010.



Ernst Jan R. Vesseur

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Vesseur obtained his PhD degree at the FOM Institute AMOLF in Amsterdam in 2011. There, he co-developed a sensitive cathodoluminescence detection system to investigate the optical behavior of plasmonic nanoantennas. After his graduation, he worked for Delmic, a Delft-based startup company developing optical detection systems for scanning electron microscopes. Vesseur now works for Caelux Corporation, a

photovoltaics startup company in Pasadena, CA.

**Maggie L. Weber**

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Weber is currently a PhD student in chemistry studying under Professor Katherine Willets at the University of Texas at Austin. She received her BS degree in chemistry in 2009 at Harvey Mudd College in Claremont, CA. Her research interests include plasmonic noble metal nanoparticles and their correlated optical and structural properties.

**Katherine A. Willets**

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Willets is an assistant professor in the Department of Chemistry and Biochemistry at the University of Texas at Austin. She received an AB degree in chemistry from Dartmouth College in 1999 and a PhD degree in chemistry at Stanford University in 2005, working with W.E. Moerner. From 2005 to 2007, she worked in the lab of Richard Van Duyne at Northwestern University. Her research is broadly focused on the area of

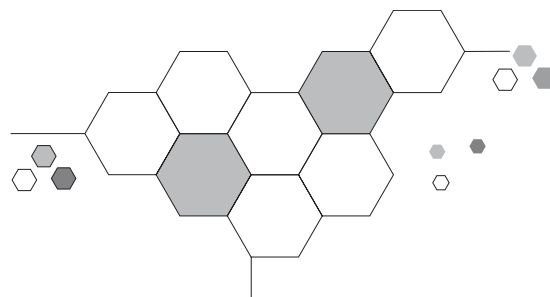
molecular plasmonics, and she is working on problems related to imaging single-molecule SERS hot spots, mapping local plasmonic enhancements on nanoparticle surfaces, detecting and quantifying optical forces on nanoparticle substrates, and studying preferential ligand binding on nanoparticle surfaces.

**Xiang Zhang**

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Zhang is the inaugural Ernest S. Kuh Endowed Chaired Professor at UC–Berkeley and director of the NSF Nano-scale Science and Engineering Center (NSEC). He is also a faculty scientist at Lawrence Berkeley National Laboratory (LBNL). Zhang is an elected member of the National Academy of Engineering (NAE) and a fellow of four scientific societies: the American Physical Society, Optical Society of America, American

Association for the Advancement of Science, and the International Society of Optical Engineering. His current research focuses on nanoscale science and technology, materials physics, photonics, and biotechnologies.



MAKING STUFF: Stronger, Smaller, Cleaner, Smarter—NOVA's pioneering science series re-airs on PBS September 19 and September 26

The world-renowned public television documentary science series NOVA, working in cooperation with the Materials Research Society, introduced the science of materials to the general public for the first time in January 2011, when the dramatic science series **MAKING STUFF: Stronger, Smaller, Cleaner, Smarter** first aired.

Now the fascinating four-hour series returns to take viewers on a thrilling tour of the materials world and present dramatic stories about how the field of materials science has changed history and is shaping the future. Each one-hour episode—**Stronger, Smaller, Cleaner, and Smarter**—gives viewers a behind-the-scenes look at scientific innovations that are happening every day on the frontiers of scientific research and ushering in a new generation of materials.

MAKING STUFF is hosted by respected journalist, New York Times technology columnist, and Emmy Award-winning CBS News correspondent David Pogue.

For more information visit www.pbs.org/nova/makingstuff.

Check local listings for programing times.

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Making Stuff: Stronger
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Making Stuff: Cleaner
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