Introducing the Special Series on Radiative Cooling

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Radiative cooling has grown rapidly as an active field of research inquiry in the last decade by leveraging recent discoveries in optics and photonics. Harnessing a natural property of our atmosphere, radiative cooling exploits the fact that thermal radiation flowing upwards from the surface of the Earth is not entirely returned back to the surface, thereby allowing a sky-facing surface to cool down below its surroundings. Advances in nanoscale photonic materials and metamaterials have recently made radiative cooling possible even during the daytime, opening new avenues of scientific inquiry, as well as exciting technological possibilities for energy efficiency. Beyond cooling, the ability to passively cool has implications for energy generation devices including photovoltaics and thermoelectric generators. Thus, it has become evident that radiative cooling may have immense implications for energy-efficient buildings, electronics, and other applications.

As this promising field of research continues to advance and expand, we are excited to begin a special series in the *Journal of Photonics for Energy* (JPE). It will focus on radiative cooling, with the goal of highlighting and synthesizing a broad array of fundamental and applied developments in the field. The special series begins in this issue of the journal (see the articles "Effects of the environmental unilateral shield on radiative cooling performance," by Kai Gao, Youwen Liu, and Honglie Shen; and "Use of hollow silica and titanium dioxide microparticles in solar reflective paints for daytime radiative cooling applications in a tropical region," by Sarun Atiganyanun), and we welcome submissions across the spectrum of radiative cooling from theoretical to practical aspects related to optics and photonics, to be published in future issues of JPE and wrapped up in the first issue of 2022, JPE Volume 12 Issue 1.

Aaswath P. Raman is Assistant Professor of Materials Science and Engineering at the University of California, Los Angeles. He received his PhD in applied physics from Stanford University in 2013. His research focuses on nanophotonics, energy applications including radiative cooling, as well as optical materials and machine learning.

Peter Bermel is the Elmore Associate Professor of Electrical and Computer Engineering at Purdue University, and received his PhD in physics from MIT in 2007. His research focuses on improving the performance of photovoltaic, thermophotovoltaic, and microelectronic systems using the principles of nanophotonics. Key enabling techniques for his work include electromagnetic and electronic theory, modeling, simulation, fabrication, and characterization.

Xiaobo Yin is the Bruce S. Anderson Faculty Fellow of the College of Engineering and Applied Sciences of the University of Colorado Boulder. His research focuses on energy and sustainability, laser spectroscopy and optical materials, design, synthesis, and scalable manufacturing of functional optical materials.