Editorial

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I am very excited with the launch of Energy Harvesting and Systems (EHS), an interdisciplinary publication that will publish original research in the areas of energy harvesting materials, energy storage materials, energy conversion mechanisms, energy harvesting circuits and system design. Articles will cover variety of technical topics including materials synthesis, energy conversion mechanisms, components and devices, micro-/nano-electronics, energy storage systems, self-powered sensor development, wireless system design, integrated hybrid architectures, computational and theoretical modeling, and novel fabrication techniques. Publications on the system level will cover diverse spectrum of technology such as electronics, sensors, unmanned aerial vehicles, medical devices, wireless communication, health monitoring, storage, human-powered textiles, and new materials. There is rapid growth occurring in all these areas owing to the advances made in reducing the power consumption of the electronics and our ability in capturing energy from the locally available environmental sources. The interest in developing energy harvesting systems is increasing by the year as the transition of technology continues to occur in many civilian and defense sectors.

Unused power exists in various forms such as industrial machines, human activity, vehicles, vibrating structures, and various other environment sources. Ambient, unused energy around us is available from various sources such as radio and television towers, satellites, cellular phone antennas, and various portable electronics. Over the past decade, several energy harvesting approaches have been proposed using solar, thermoelectric, electromagnetic, piezoelectric, turbines, magnetoelectric, and capacitive schemes. The research in this arena has led to the development of wide variety of prototypes demonstrating feasibility of implementing energy harvesting systems in practical components and devices. Further, these prototypes have been demonstrated at various scales ranging from nano- to macro-scale applications. At nano-/micro-scale, there are a number of possible solutions such as thin-film Li-batteries, dye-sensitized TiO_2 nanoparticles, micro–fuel cells, nano-nuclear energy, and molecular power sources. This journal brings together research contributions from all these energy harvesting areas ranging from materials to system integration. It targets the audience conducting research and development in the area of "self-powered" integrated hybrid systems. To exemplify, one can think of developing the rectifying antennas (rectenna) based on multiferroic materials to efficiently convert the wireless signals around us in the range of 915 MHz to 3 GHz to useful electric energy. Another example would be of organic low power transistor circuits with performance characteristics suitable for practical applications such as self-powered radio-frequency identification tags, flexible sensors, and low-cost large area electronics. Several civilian and defense examples can be cited that will be directly benefited with the developments in this field such as smart homes, smart highways, watch-based cell phones and music players, radar, GPS, and smart automobiles.

As sensors and data acquisition components continue to proliferate in distributed networks, the need for decentralized energy sources for their operation becomes critical. In various applications such as sensors for structural health monitoring in remote locations, embedded systems, geographically inaccessible temperature or humidity sensors, the need for persistent power source is not an option rather a mandatory requirement. The emphasis in these cases has been on developing the on-site energy harvesters that can capture any available form of energy at the location into electrical energy. This requirement has been driving research and several new concepts are being developed that can be directly integrated with the silicon platform. As this integration continues to occur, the utility of energy harvesting devices will become as normal as currently batteries are in our lives. This journal will provide the platform for

publishing all these advances and will make best effort in serving the community by publishing the original articles in a timely manner.

I am very proud of the distinguished team of associate editors and industrial advisory board members that are part of Energy Harvesting and Systems. I would like to take this opportunity to thank them for their excellent contributions and dedication toward the success of this journal. I would also like to acknowledge the extraordinary support and knowledge that De Gruyter staff provides in making the journal operations simpler and efficient. Without their extensive support this would not be possible. We all invite you to consider submitting your relevant work to this journal and provide us the opportunity to work with you in disseminating your very important research to the community.