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**Keynote 4: Listening to the Whispers: Enhanced SWIPT Wake-Up Receiver for IoT Sensors**

Speaker: Dominique Schreurs (KU Leuven, Belgium)

Chair: Qiaowei Yuan (Tohtech, Japan)

Abstract:

To address the challenges of energy constraints in Wireless Sensor Networks (WSNs) and Internet of Things (IoT) devices, this work presents an enhanced wake-up receiver for Simultaneous Wireless Information and Power Transfer (SWIPT) applications. The proposed design incorporates a passive  $2 \times 2$  Multiple-Input Multiple-Output (MIMO) antenna configuration, which enhances the sensitivity and reliability of detecting wakeup signals under diverse environmental conditions. The architecture also includes a 2stage rectifier and operational amplifiers (op-amps) to efficiently harvest energy from radio-frequency (RF) signals. An important breakthrough is the integration of backscattering technology, which allows the wake-up receiver to support battery-less operations in IoT networks. This effectively minimizes energy consumption and prolongs the



lifespan of the devices. The double capacity of the receiver to activate sensor nodes and transmit data through radio frequency signals provides a practical and environmentally friendly solution for the IoT.

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**Keynote 7: High Power Electric Generation and WPT Demonstration Mission**

Speaker: Xinbin Hou (China Academy of Space Technology, China)

Chair: Bo Yang (Kyoto University, Japan)

Abstract:

Space Solar Power is important development directions for the world to tackle the climate change. High power generation and long distance wireless power transmission are the most important technologies of SSP and need to be demonstrated step by step to meet the demand to construct the commercial SSP. This paper presents a proposed firststep demonstration mission in space. The mission includes a main spacecraft and an energy receiving spacecraft in LEO. The main spacecraft will emit about 4kW microwave and 1km laser to the receiving station on ground to demonstration the WPT chain. At same time, the receiving spacecraft will receive laser to demonstrate LPT in space.

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