



# NATO Advanced Research Workshop

RPTU

## Functional Spintronic Nanomaterials for Radiation Detection and Energy Harvesting



### **Spectrum analysis and energy harvesting in spintronic diodes**

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Spintronic diodes (SDs) are promising nano-scale devices, which can convert incident microwave power to an output DC (or low-frequency) voltage with an efficiency (volt-watt sensitivity for quadratic detectors, detector's threshold power, noise properties of the detector, etc.) comparable to or exceeding that of semiconductor diodes. In addition to a well-known resonant signal detection technique in SDs, the diodes can be used for signal detection in a wide frequency band (non-resonant detectors), for spectrum analysis issues, and for the energy harvesting applications, for instance, in the scope of the Internet of Things technology. This paper contains a brief description of SD basics and a review of recent advances, trends, and problems in the physics and applications of SDs with stress on issues involving spectrum analysis and energy harvesting applications.