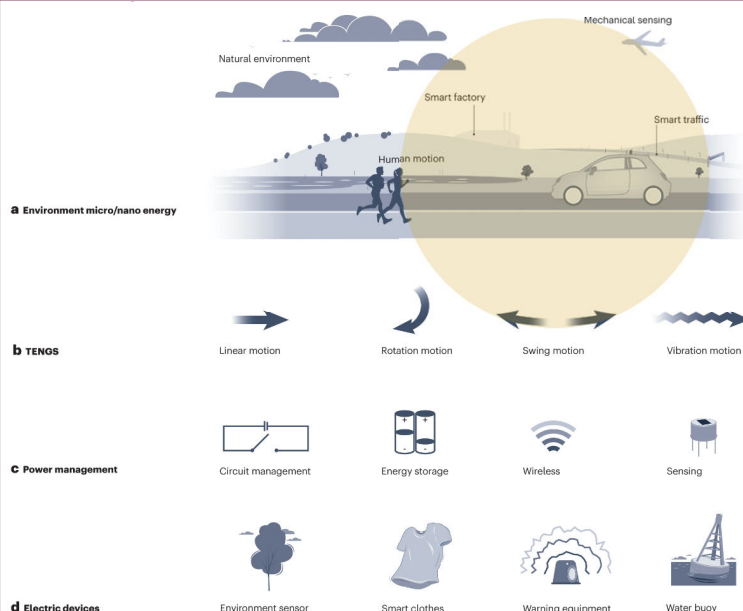




Triboelectric Nanogenerators for Mechanical Energy harvesting

J.M. Zhou, K.C. Yip, Y.Q. Su, Y.H. Lin, X. Ma, Dong-Myeong Shin
Department of Mechanical Engineering

Energy Harvesting from Ambient Environments

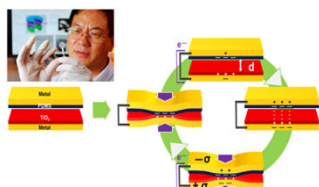


Nav. Rev. Methods Primers 3 (2023) 39

Electromechanical Energy Harvesting

Triboelectric Nanogenerators!

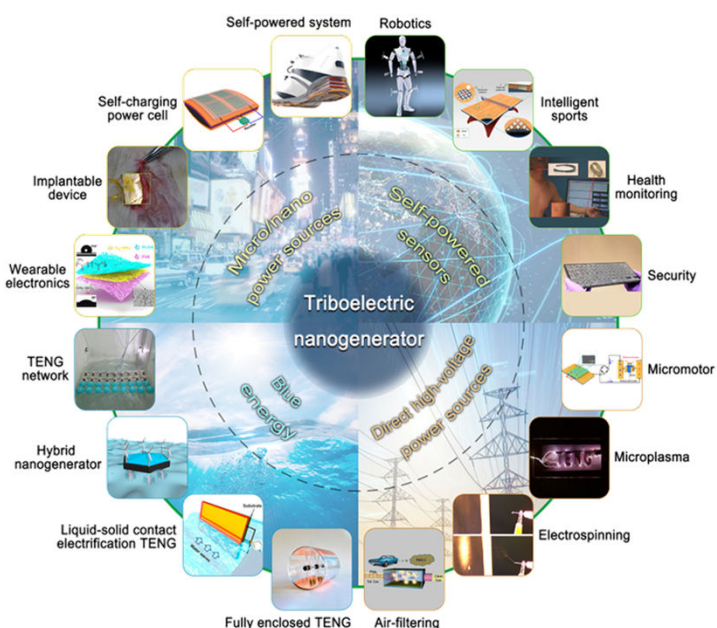
Contact electrification in tandem with electrostatic induction



Advantages:

- Abundant sources
- Sustainability
- Diverse choice of materials
- High efficiency at low frequency
- Low cost, low weight
- High power density: > 200 mW/cm²

Nano Energy 1 (2012) 328



EcoMat 2 (2020) e12059

The Shin Group Strategy

SHIN RESEARCH GROUP
Energy & Environmental Engineering Lab.

Elucidating Charge Transfer Mechanism

Droplet Energy Harvesting

Mitigating Wear and tear

Self-Powered Electronics

Adv. Funct. Mater. in press

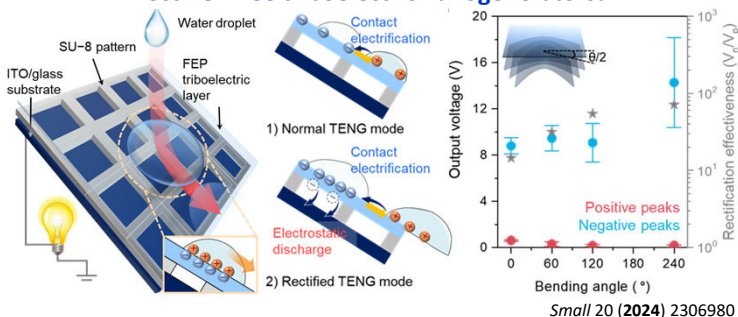
Small 20 (2024) 2306980
Device 3 (2025) 100653

Adv. Mater. 33 (2021) 2102530
In preparation

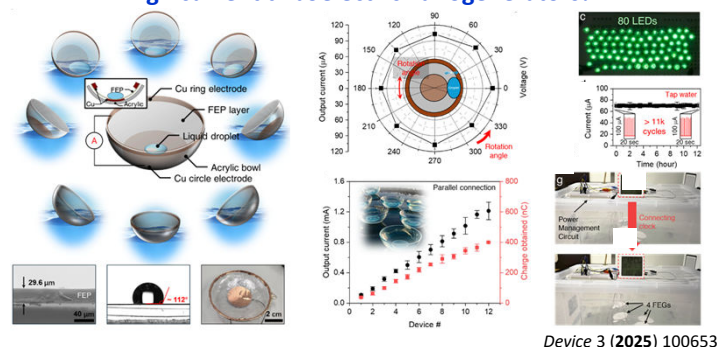
Nano Energy 113 (2023) 108589

The Shin Group Research Highlight

Rectifier-free triboelectric nanogenerators!



High current triboelectric nanogenerators!



Concurrent charge transfer in contact with ionomers!

