

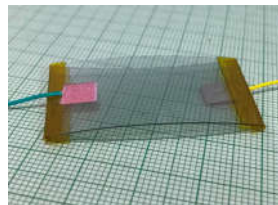
# Triboelectric Generator Based on Biocompatible Polymer



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- A triboelectric charge is developed between two insulating substrates by mechanical action
- The amount of charge generated depends on the contact area, pressure, and friction between the two materials
- Choice of materials is very important to maximize the charge generation
- Triboelectric generators based on biocompatible polymer films

## TEG Device Developed at CeNS



TEG Device

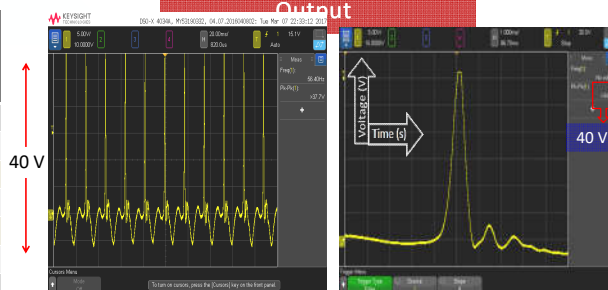


Operated with Body Massager

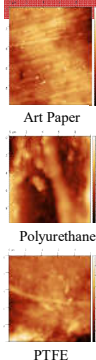
Operating Force : F1 = 0.23 N ; F2 = 0.33 N  
Friction Area: 1.5 cm<sup>2</sup>

S. No.	Materials	F1 Voltage (V)	F1 Current (μA)	F2 Voltage (V)	F2 Current (μA)
1.	BCP1	0.3	0.4	0.4	0.6
2.	BCP2	5	1.8	7	3
3.	BCP3	6	2.5	8	3.7
4.	BCP4	15	8	18	11.7
5.	BCP5	15	10	21	13.5
6.	BCP6	21	12	26	19
7.	BCP7	35	20	40	26

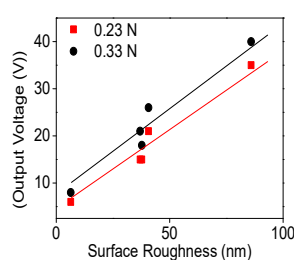
## TEG Device Electrical Output



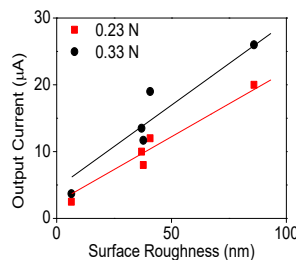
## Surface Roughness of the Polymer Films - AFM studies



### Roughness vs. voltage

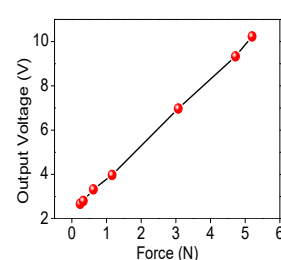


### Roughness vs. current



## Self-Powered Pressure Sensor

### Force vs. TEG Output Voltage



## Walk to Charge:

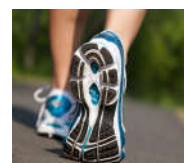
- Harness energy by simply walking
- Local generators
  - Flash light without batteries
  - Charge mobile phones
- It pays to exercise
- Can even be used as a self-powered pressure sensor

## Energy harvesting from

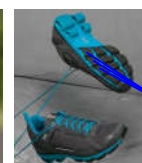
- Simple mechanical action viz., tapping
- Locally available materials
- Can be used as self-powered pressure/touch sensor, LED's and all smart devices

## Future goal

- Large area device which can cater to higher pressure
- Capable of charging batteries/supercapacitor
- Come out with new TEG devices



Shoe with TENG Array



TEG Array

Local Processor  
e.g., Supercapacitor

User device

Storage