*This project leading to this application has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101017858*

# ELECTRO-INTRUSION

## FET Proactive project

Research meets industry, 4th March 2021, on-line

Yaroslav GROSU

CIC energiGUNE

MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

# The philosopher´s stone

**CAN TRANSFORM BASE METALS INTO GOLD AND SILVER**

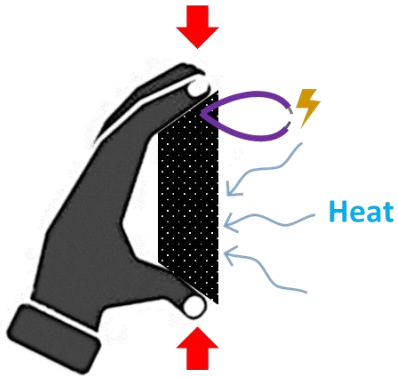
## Still searching…

**Something non-valuable + philosopher´s stone → Gold**

# > The philosopher´s stone v2.0

**ELECTRO-INTRUSION PROJECT**

**Intrusion-extrusion**
**Triboelectric generator**




**Work (vibrations)**
**+**
**Ambient heat**
→ **Electricity**

$$\frac{\text{Electricity}}{\text{Work}} > 1$$

# > The philosopher´s stone v2.0

**ELECTRO-INTRUSION PROJECT**

**Intrusion-extrusion**
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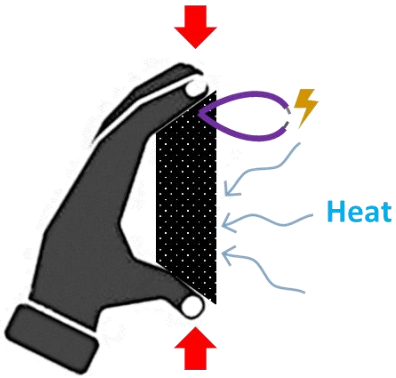


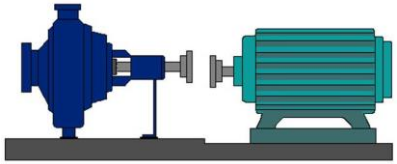

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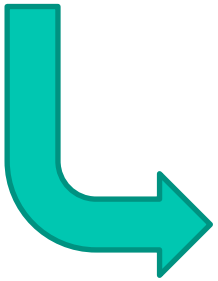


$$\frac{\text{Electricity}}{\text{Work}} > 1$$

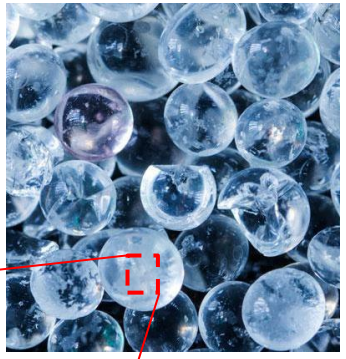
# The philosopher´s stone v2.0

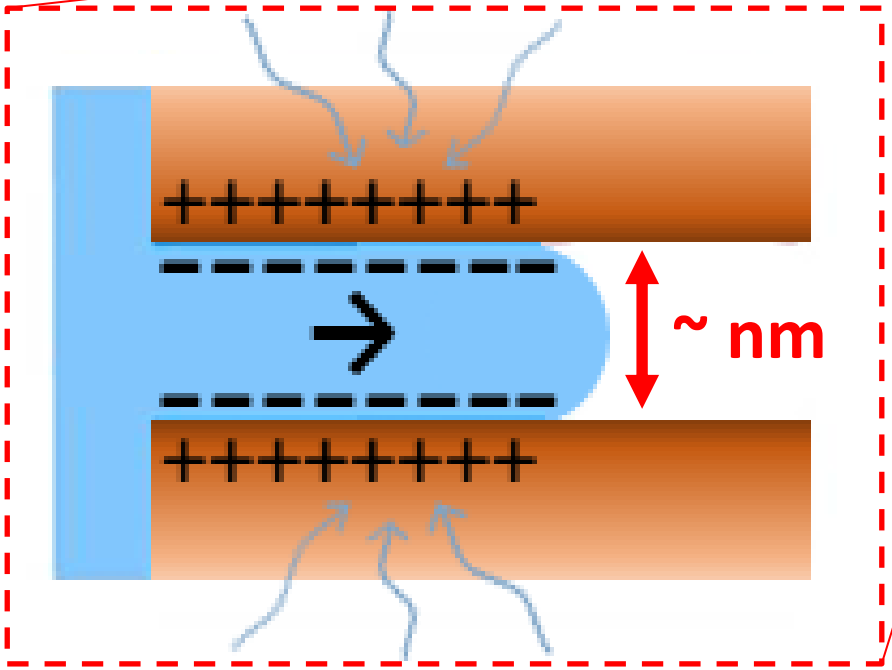
## THE PRINICPLE

**(Undesired vibration + environmental heat) + small stone**

↓

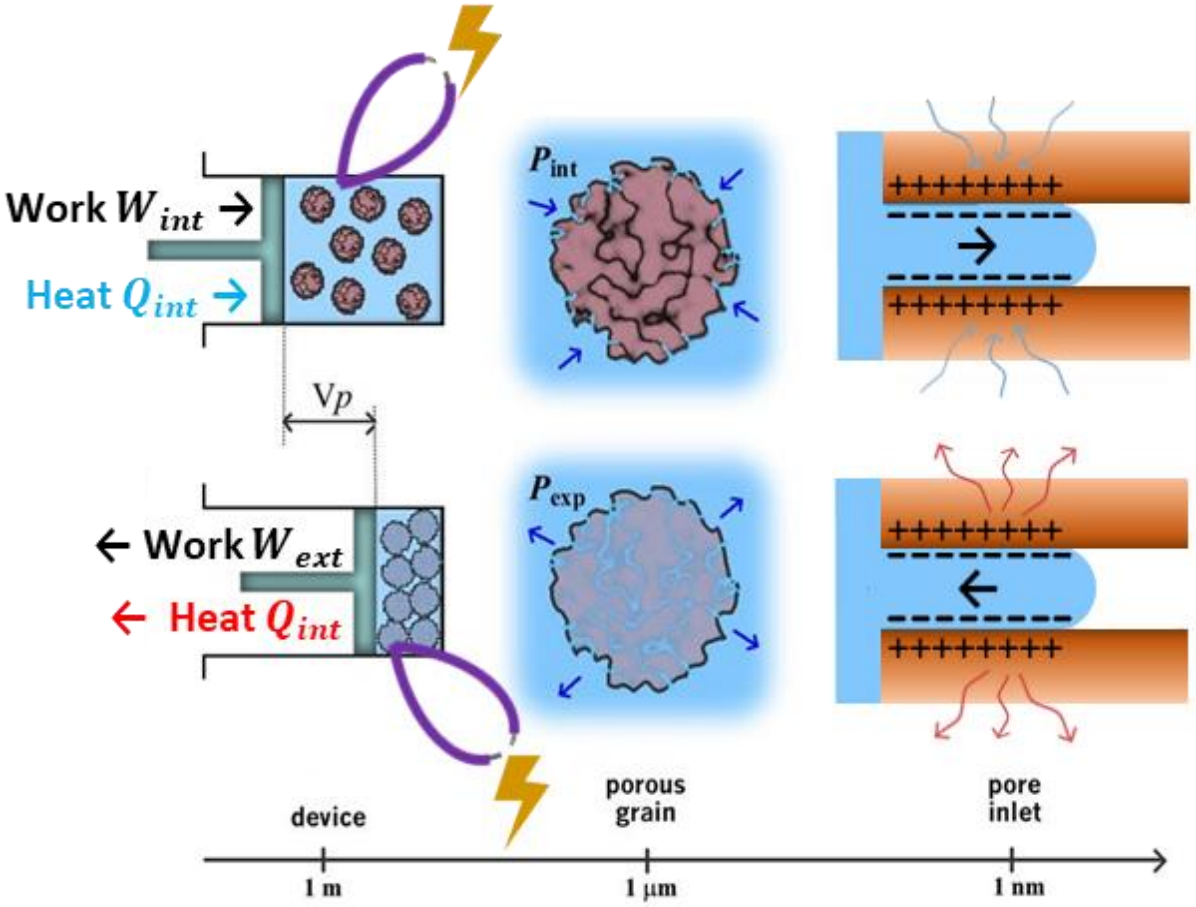
**Electricity**





# How does it work?

**PRETTY SIMPLE ACTUALLY**



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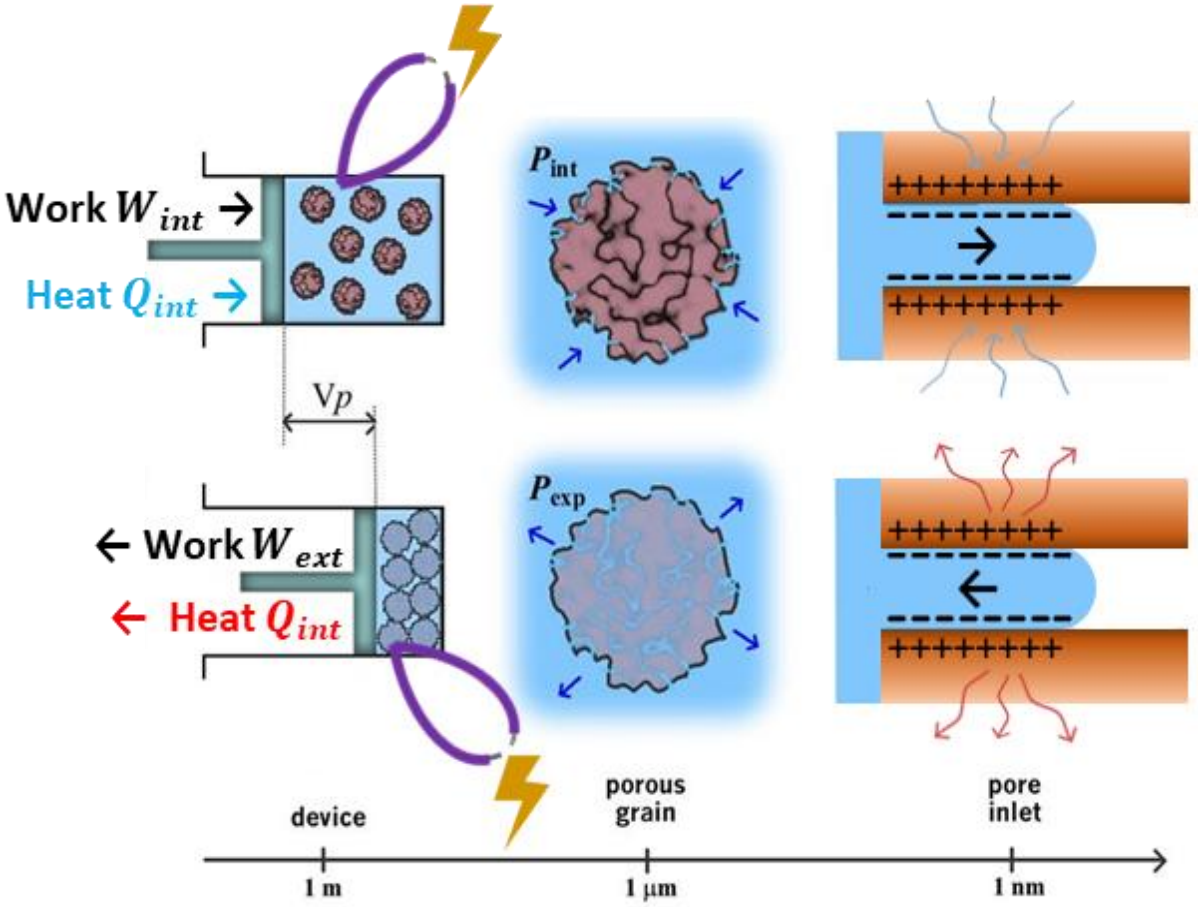
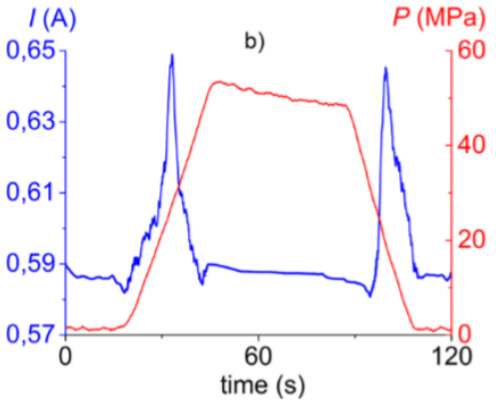
**PRETTY SIMPLE ACTUALLY**




**Proven experimentally:**

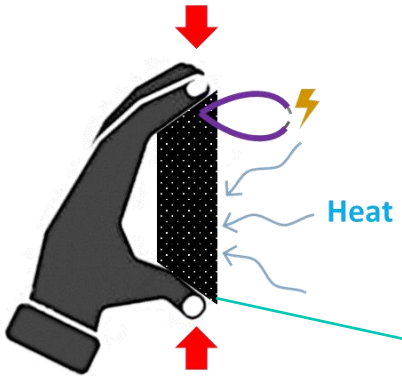



Grosu Y et al 2017 ACS Appl Mater Interfaces
Lowe A et al 2019 ACS Appl Mater Interfaces

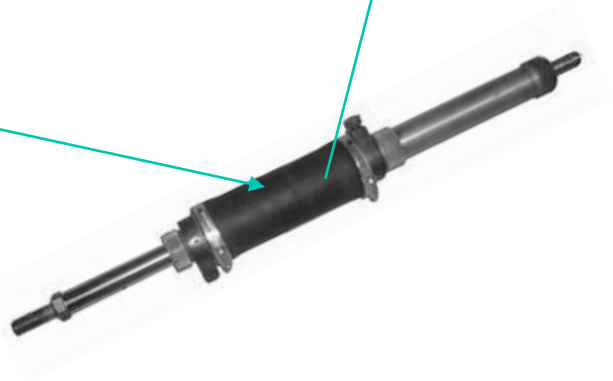
# > How does it work?

**ELECTRO-INTRUSION PROJECT**

**Intrusion-extrusion**
**Triboelectric generator**







**Work (vibrations)**
**+**
**Ambient heat**

→ **Electricity**

**Electric vehicules with maximum range enhanced by the philosopher´s stone v2.0**

# > THE PROJECT AT A GLANCE

## DURATION, BUDGET, AMBITION

- **Budget**: 3.651.381,25 €
- **Duration**: 4 years (01/01/2021 – 31/12/2024)
- 6 partners
- H2020 Topic: FETPROACT-EIC-07-2020 – Emerging paradigms and communities

- **Ambition**:
  1. Develop a new highly efficient method for energy conversion for a wide range of applications
  2. Propose a new type of regenerative shock-absorbers and make first steps towards its implementation
  3. Generate breakthrough knowledge regarding triboelectrification and heat of intrusion-extrusion

**From TRL 1-2 to TRL 4-5 by investigating the underlying physical phenomena, maximizing the electrical output and building a relevant prototype**

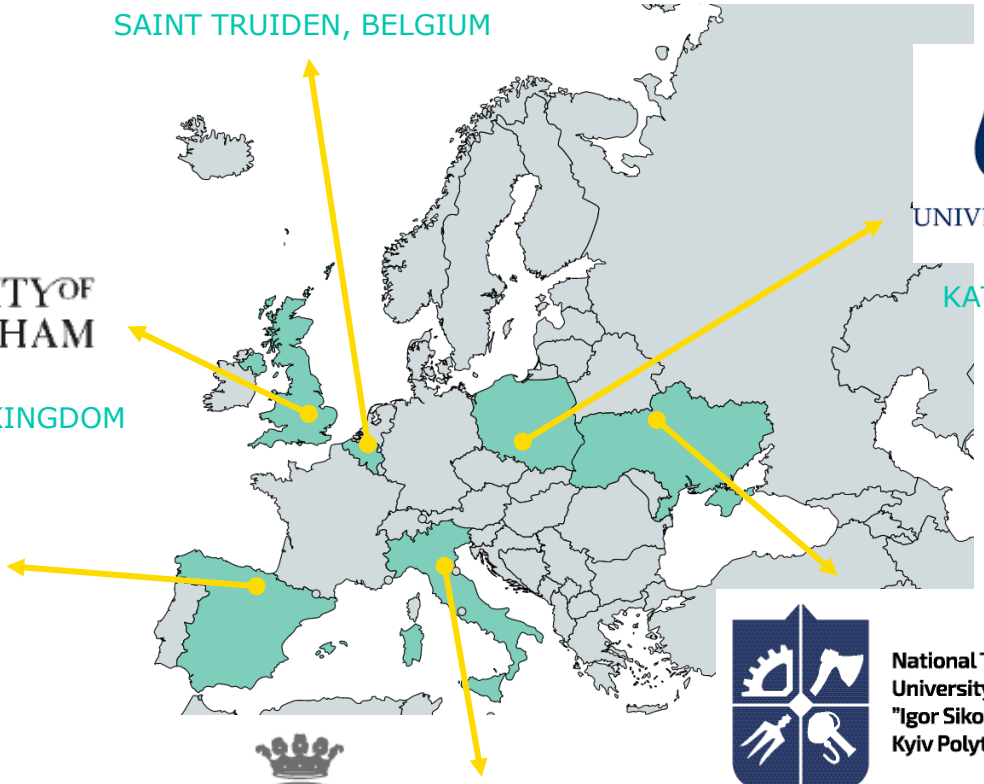
# > PARTICIPANTS

## ELECTRO-INTRUSION PROJECT

**6 Partners**
**4 Universities**
**1 R&D Institutes**
**1 Company**

TENNECO DR1V

SAINT TRUIDEN, BELGIUM



UNIVERSITY OF BIRMINGHAM

BIRMINGHAM, UNITED KINGDOM

UNIVERSITY OF SILESIA IN KATOWICE

KATOWICE, POLAND

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VITORIA-GASTEIZ, SPAIN

National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute"

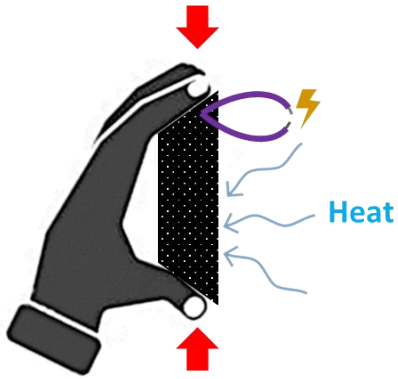
KYIV, UKRAINE

UNIVERSITY OF FERRARA - EX LABORE FRUCTUS -

FERRARA, ITALY

# > The philosopher´s stone v2.0

**ELECTRO-INTRUSION PROJECT**




**Having some excess heat or work?**

**Let us know!**

**We convert it into electricity**

**with a very attractive exchange rate!**

$$\frac{\text{Electricity}}{\text{Work}} > 1$$

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**GRACIAS · THANK YOU · ESKERRIK ASKO**

CIC energiGUNE

MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

**LET'S WORK TOGETHER**

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*Making sustainability real*

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