NOMATEN
Centre of Excellence in Multifunctional Materials for Industrial and Medical Applications

NOMATEN: Centre of Excellence in Multifunctional Materials for Industrial and Medical Applications

NOMATEN Project & NOMATEN CoE

Jacek Jagielski

NATIONAL CENTRE FOR NUCLEAR RESEARCH ŚWIERK

cea

VTT

NOMATEN Centre of Excellence has been created in Poland as a new research organization in which **international world-class** research teams will design, develop and assess **innovative multifunctional materials** – materials combining advanced structural and functional properties – **for industrial and medical applications**

Funding and support:

European Union Horizon 2020 research and innovation programme under grant agreement **No 857470**; total **14 985 682,50 EUR**

European Regional Development Fund via **Foundation for Polish Science** International Research Agenda PLUS programme grant No **MAB PLUS/2018/8;** total **9 842 444,80 EUR**

Ministry of Science and Higher Education - Republic of Poland; total **5 143 237,70 EUR**

Ministry of Energy - Republic of Poland

Marshal of the **Mazowieckie Voivodeship**

National Centre for Nuclear Research; 1 mln PLN yearly

Aims

- The overall aim of the Teaming project is to support the growth of the NOMATEN Centre of Excellence (CoE) in Multifunctional Materials for Industrial and Medical Applications

- The success and long-term sustainability of the NOMATEN CoE will be based on:
  - Strategic Research and Innovation Agenda focused on two interdisciplinary topics:

    (i) ***novel materials resistant to harsh environments*** *and*

    (ii) ***novel radiopharmaceuticals for medical applications****, which both are aligned with the Smart Specialization of Poland and address strategic priorities of the EU.*
  - Organization structure positioning the CoE as a “game changing” research entity in Poland with truly international approach and innovative governance and management principles based on the best practices of international partners.
  - Customer-centric business model making the CoE a focal point for collaboration between the research community, industry and government and ensuring its financial viability.

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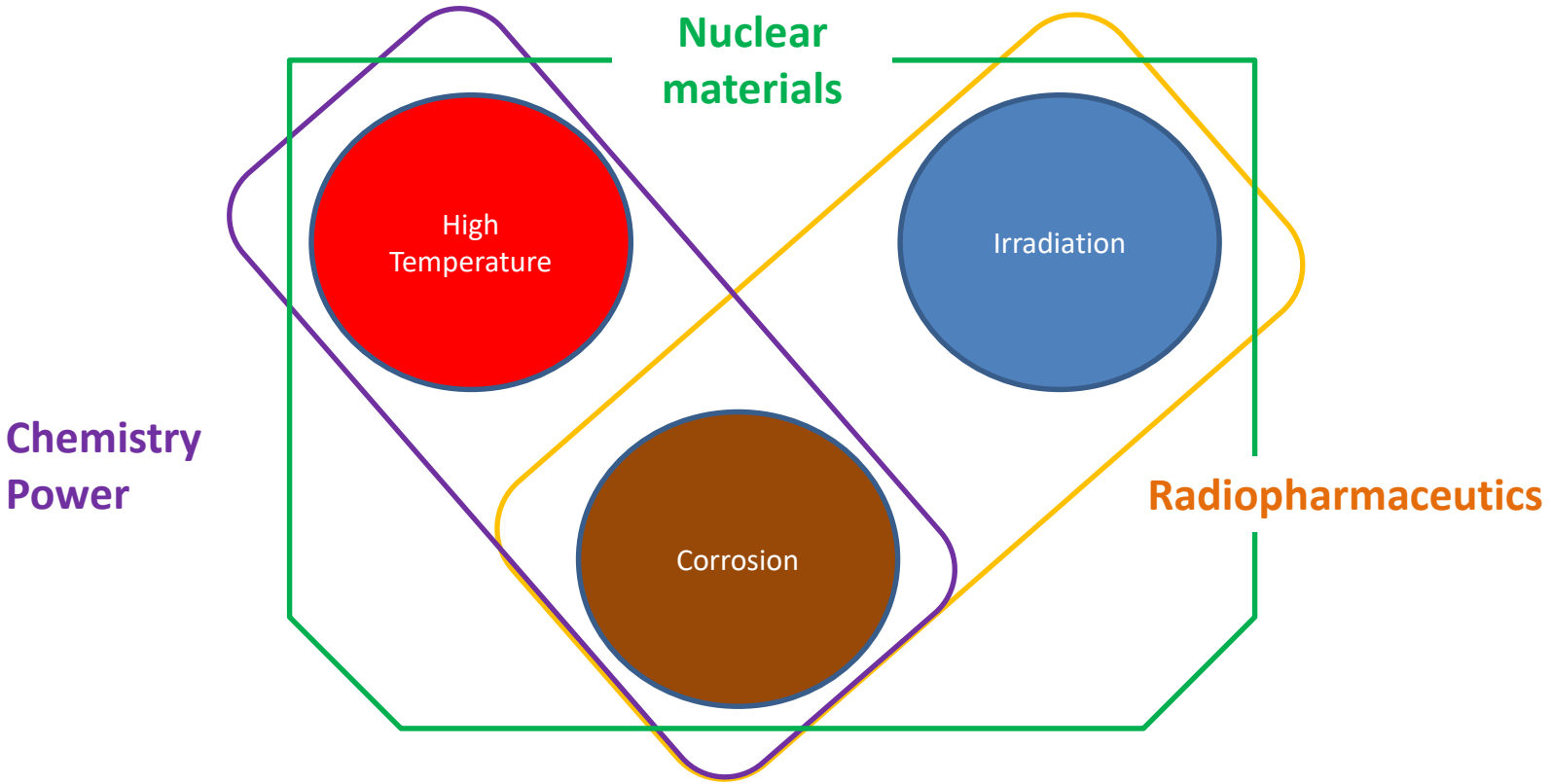
Aims



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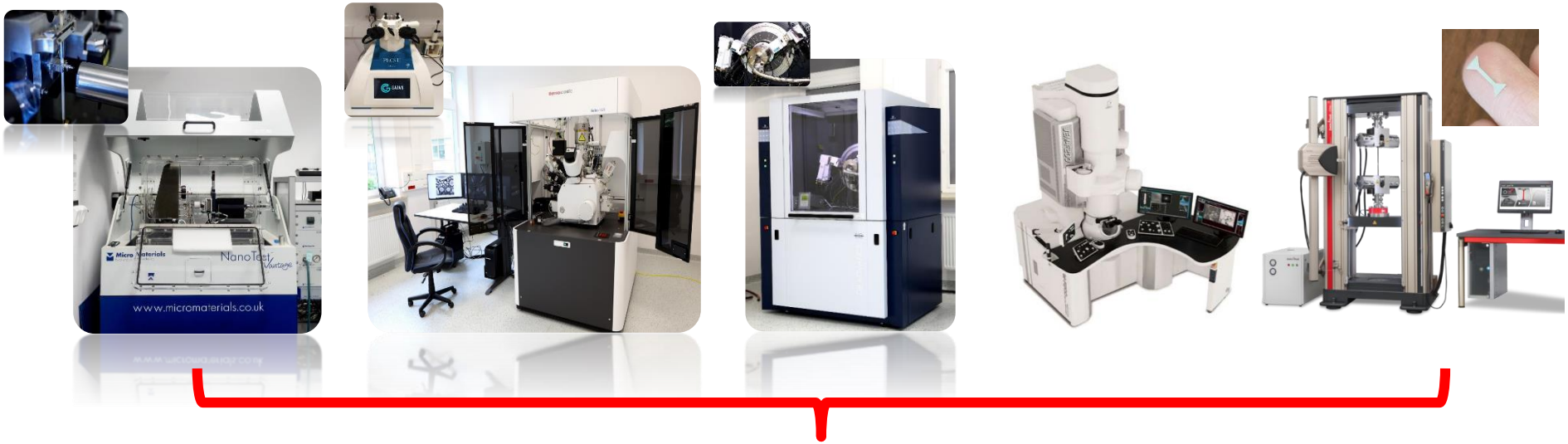
Aims

Modelization and characterization of materials from nano to macro

Nanoindentation | **SEM/EDS/EBSD/FIB** | **XRD/GID** | **HR TEM** | **MSSTT**



Specialization –> *in-situ* analysis in harsh environments *(air, gases, water, steam,… T >1000C)*

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Opportunities

- **NOMATEN should be regarded as a tool for initiation of a broad cooperation network on materials for harsh environment in Poland and in Europe**

- Close collaboration with strategic partners (CEA and VTT)
- Participation in large EC and national projects
- Access to infrastructure in partner institutions and through Transnational Access Programs
- New investments in NOMATEN CoE
- Central hub for industrial contacts in material science in the NCBJ
- Co-financing of Ph.D. theses
- Financing of post-docs stays
- Organization of schools, workshops, meetings, conferences, short term visits

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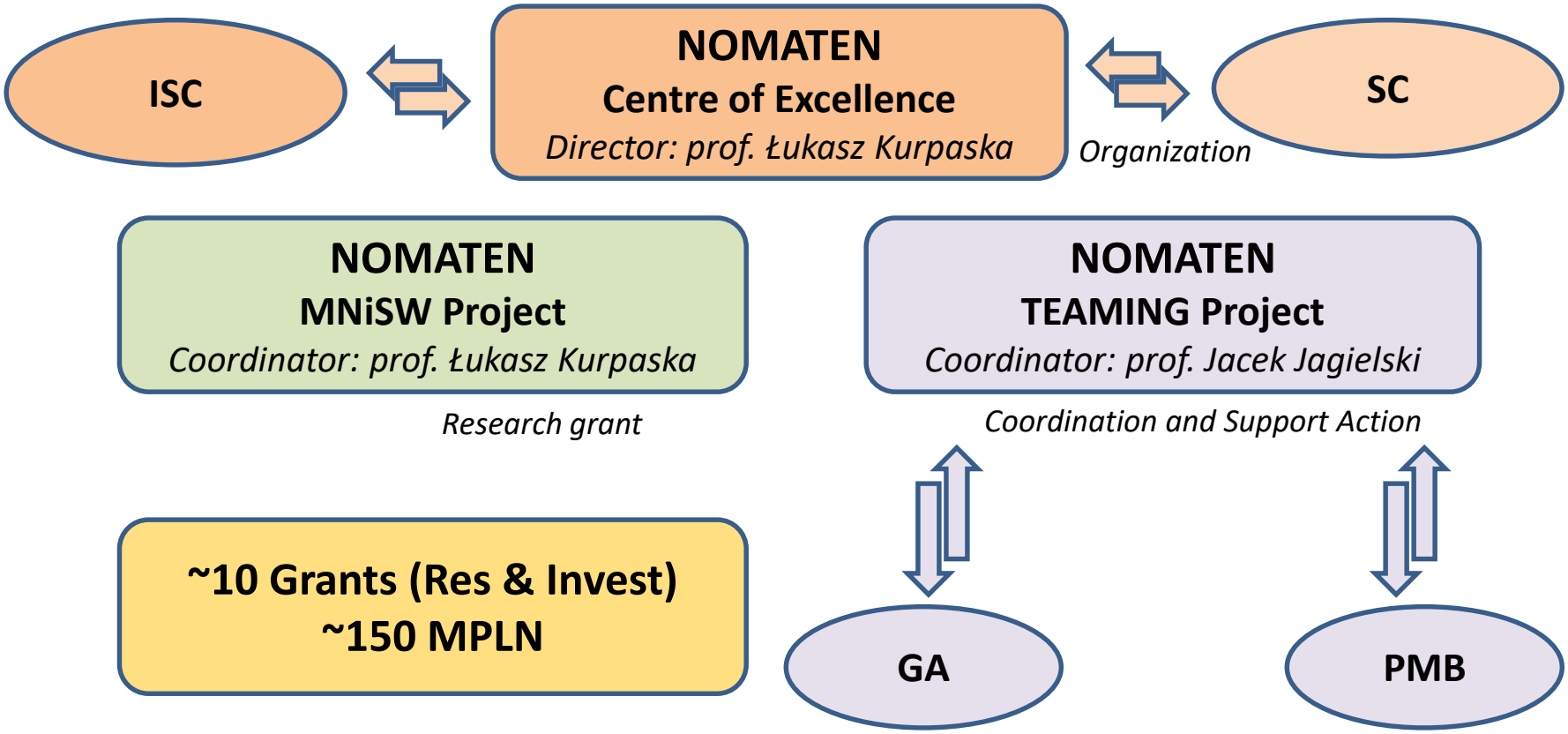
Structure



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Organization

Five Research Groups:

1. **COMPLEXITY IN FUNCTIONAL MATERIALS**
2. **FUNCTIONAL PROPERTIES**
3. **MATERIALS CHARACTERIZATION**
4. **MATERIALS STRUCTURE, INFORMATICS AND FUNCTION**
5. **NOVEL RADIOPHARMACEUTICALS FOR MEDICAL PURPOSES**

New Research Groups planned:

*6. **MARIA NEUTRON LABORATORY***
*7. **CORROSION LABORATORY***

Use of large EU infrastructure

Building of large infrastructure in Poland

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Past and current situation

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Current situation

- **Covid Recovery Plan– NOMATEN Core + MNL 110 MPLN**
- SPUB 2023 – 2025 – 9.5 MPLN
- Ministry Entrepreneurship (HTGR) – 20.5 MPLN

Infrastructural grants

Summary 5:1- infrastructure 125 MPLN vs research grants 25 MPLN

PL projects

- Sonata BIS (2x)
- Polonez Bis (edycja 1 i 3)
- Prelludium (3x)
- Sonatina (2x)

9 MPLN from NCN

EC projects

- **Connect NM (2025 – 2030)**
- Orient NM
- MSCA (MagniFiCor)
- INNUMAT (2024 – 2027)
- Accelerate.EU
- SafeG (2020 – 2024)
- M4F i GEMMA (2017 – 2021)

2.0 MEuro

Other

- ATF cladding (8 MPLN)
- OFFERR + OA JRC (2x) + Esteem3 + RADIATE + DESY/Solaris/Diamond
- Stypendia: Zawacka, Bekker, Fulbright, Fundacja Kościuszkowska

3.0 MEuro

Research grants

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Current situation

- **5 out of 8 years**
- **40+ personnel**
- **40 deliverables (out of 59)**
- **11 milestones (out of 14)**
- **4 NOMATEN Schools (Paris 2021 and 2024, Helsinki 2022, Świerk 2023)**
- **10 Ph.D. students (2 Ph.D. and 3 D.Sc. received)**
- **Main collaborations: MIT, INL, JRC, Ciemat, UKAEA, KIT, IIT, SCK (roughly 30 institutions)**
- **Publications 110+ *(Acta Mat., PRL, JNM, ASS, MSE A, Small czy Adv. Mat…)***
- **1 patent (+1 submitted)**

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Contacts with industry

AISI 316L seamless pipes NDT testing for ITER Blanket System components (First wall panels cooling system) – commissioned by ITER's supplier BIMO TECH



Accredited NDT tests realized according to:

FF9U2X Technical Specification X2CrNiMo17-12-2, (No. 1.4404) Tube for Blanket Application

Supply of Normal Heat Flux First Wall (FW) Panels for ITER Blanket System INSPECTION NOTIFICATION

***Visual Testing VT** – visual inspection outer / inner surface*
***Ultrasound tchickness test UTT** – wall tchickness*
***Direct meaurements** – pipes dimensions*

Inspection of CIŚ II collectors

Industrial contracts possible thanks to (costly!) accreditation


ZAKRES AKREDYTACJI
LABORATORIUM BADAWCZEGO
SCOPE OF ACCREDITATION FOR TESTING LABORATORY
Nr/No: AB 025

NARODOWE CENTRUM BADAŃ JĄDROWYCH
LABORATORIUM BADAŃ MATERIAŁOWYCH
ul. Andrzeja Sołtana 7
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PCA
POLSKIE CENTRUM AKREDYTACJI
BADANIA
AB 025

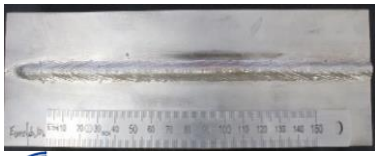
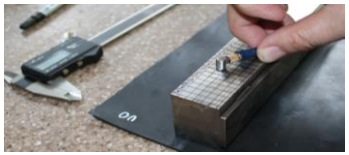
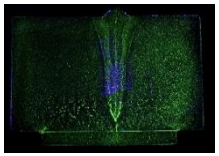
ilac-MRA


POLSKIE CENTRUM AKREDYTACJI
POLISH CENTRE FOR ACCREDITATION

CERTYFIKAT AKREDYTACJI
LABORATORIUM BADAWCZEGO
ACCREDITATION CERTIFICATE OF TESTING LABORATORY
Nr AB 025

NARODOWE CENTRUM BADAŃ JĄDROWYCH
LABORATORIUM BADAŃ MATERIAŁOWYCH
ul. Andrzeja Sołtana 7, 05-400 Otwock

EUROFER 97 EBM welds, NDT contract with KIT

EUROfusion

Industrial contracts from: Mercedes Benz, Arcelor Mittal, Salloytech, Mago, Aviation M. Trendak, ZDAJ, IK, Boccard, Tomex Brakes, Biuro Veritas, Zarmen, ….

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Thank you for your attention

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