Cluster 5

Climate, Energy and Mobility

This cluster aims to fight climate change by better understanding its causes, evolution, risks, impacts and opportunities, and by making the energy and transport sectors more climate and environment-friendly, more efficient and competitive, smarter, safer and more resilient.

AREAS OF INTERVENTION

- climate science and solutions
- energy supply
- energy systems and grids
- buildings and industrial facilities in energy transition
- communities and cities
- industrial competitiveness in transport
- clean, safe and accessible transport and mobility
- smart mobility
- energy storage

Source: Cluster 5

PhD, DSc

Anna Walkiewicz

DEPARTMENT OF NATURAL ENVIRONMENT BIOGEOCHEMISTRY

INSTITUTE OF AGROPHYSICS, PAS

DIVISION II - BIOLOGICAL AND AGRICULTURAL SCIENCES

A.WALKIEWICZ@IPAN.LUBLIN.PL

+48 81 744 50 61 EXT. 205

EXPERTISE

We focus on measurements of soil greenhouse gases (CO2, CH4, N2O) fluxes in natural and agricultural ecosystems. We conduct experiments at the field scale (arable lands, grasslands and forests) and laboratory scale (determining e.g. potential of methane emission and uptake). We are interest in finding methods to mitigate GHG emissions and improve soil conditions acting in an interdisciplinary manner, and combining results from field and microbial (e.g. NGS and quantitative PCR) research.

SEEKING FOR COLLABORATION WITHIN

soil GHG fluxes, methane formation and oxidation, modelling of soil GHGs, molecular biology

RELEVANT PROJECTS

ReLive

ERA-GAS Programme

NCN/OPUS21

Professor, DSc

Magdalena Frąc

DEPARTMENT OF SOIL AND PLANT SYSTEM

INSTITUTE OF AGROPHYSICS, PAS

DIVISION II - BIOLOGICAL AND AGRICULTURAL SCIENCES

M.FRAC@IPAN.LUBLIN.PL

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EXPERTISE

The department is focused on research concerning microorganisms biodiversity and resilient plant. We are interested in soil quality, soil health markers and living labs concept. Our interests concern soil-plant-microbiome interactions inclusive of (a)biotic stress factors under changing climate. We conduct work on bioproduct, biofertilizers and biotechnological solutions for agroecology, including diagnostics, control and monitoring of key pathogens in sustainable agriculture and horticulture.

SEEKING FOR COLLABORATION WITHIN

antimicrobials; microbial diversity; one health; plant holobiont; soil-plant-microbiome interactions

RELEVANT PROJECTS

LEGUMINOSE

SoilCare

iSQAPER

SPIN-FERT

PhD, Assistant Professor

Robert Bialik

ABIOTIC STRESS RESEARCH: REDOX SIGNALS

INSTITUTE OF BIOCHEMISTRY AND BIOPHYSICS, PAS

DIVISION II - BIOLOGICAL AND AGRICULTURAL SCIENCES

RBIALIK@IBB.WAW.PL

+48 22 592 57 93

EXPERTISE

The Department of Antarctic Biology is responsible for the scientific program that is undertaken at the Arctowski Polish Antarctic Station, providing expert opinions about Antarctica for numerous Ministries of the Republic of Poland. We specialize in physical oceanography, marine biology, glaciology, and meteorology, with a particular focus on biology, including conservation biology, ecology, and microbiology.

SEEKING FOR COLLABORATION WITHIN

Antarctic Important Bird and Biodiversity Areas, radiospectrometry, remote sensing in polar regions

RELEVANT PROJECTS

NCN/OPUS13

NCN/SONATA7

PhD
Emilia Pers-Kamczyc
DEPARTMENT OF GENETICS AND ENVIRONMENTAL INTERACTIONS

INSTITUTE OF DENDROLOGY, PAS
DIVISION II - BIOLOGICAL AND AGRICULTURAL SCIENCES
EPK@MAN.POZNAN.PL
+48 61 817 00 33

EXPERTISE

Our team has experience in assessing the genetic variability of the phenotypic traits and local adaptation of economically used woody plant species, especially to water and HMs stresses, in searching for new genetic markers used in breeding and genomic selection of forest trees, in assessing the genetic diversity of local populations, and in species restoration. We also study plants' molecular responses to environmental conditions, resource availability and climate change.

SEEKING FOR COLLABORATION WITHIN

selection and breeding of forest trees, quantitative genetics, abiotic stresses, OMICs, seed quality

RELEVANT PROJECTS

Projects

Professor
Andrzej M. Jagodziński
DEPARTMENT OF ECOLOGY

INSTITUTE OF DENDROLOGY, PAS
DIVISION II - BIOLOGICAL AND AGRICULTURAL SCIENCES
AMJ@MAN.POZNAN.PL
+48 61 817 00 33

EXPERTISE

Our research deals with the effects of global climate change on the functioning of forest ecosystems, environmental determinants of stand biomass production and carbon storage, modelling of natural processes in forest ecosystems (e.g. decomposition, primary production), and the causes and consequences of biological invasions of trees and shrubs. We also determine possible changes in the geographical ranges of woody plant species in various climate change scenarios.

SEEKING FOR COLLABORATION WITHIN

climate change, stand biomass, decomposition, invasion biology, functional ecology

RELEVANT PROJECTS

Projects

Professor
Jarosław Stolarski
BIOSTRUCTURES AND BIOMINERALIZATION WORKING GROUP

INSTITUTE OF PALEOBIOLOGY PAS
DIVISION II - BIOLOGICAL AND AGRICULTURAL SCIENCES
STOLACY@TWARDA.PAN.PL
+48 22 697 88 79

EXPERTISE

Our laboratory is focused on investigating biomineralization processes. In particular, we are interested in: (i) structural and biogeochemical features of biominerals, (ii) physiological and environmental factors affecting their formation, and (iii) their functional and phylogenetic significance. We work on various groups of fossil and recent organisms (e.g., corals, echinoderms) using modern analytical techniques (including experimental studies).

SEEKING FOR COLLABORATION WITHIN

biomineralization, bio-inspired engineering, paleoproteomics, paleogenomics

RELEVANT PROJECTS

NCN/OPUS
NCN/OPUS
NCN/OPUS
NCN/SONATA

PhD, DSc
Urszula Szeluga
LABORATORY OF CARBON AND POLYMER-CARBON MATERIALS

CENTRE OF POLYMER AND CARBON MATERIALS, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES
USZELUGA@CMPW-PAN.PL
+48 32 271 60 77 (EXT. 245)

EXPERTISE

Carbon materials show great promise for energy storage and biomolecule detection systems. Our team specializes in the synthesis, functionalization and surface modification of carbon materials, including graphene, applied individually and in polymer-carbon composites. We study the relationship between the structure and electrochemical properties of such materials and focus on their potential applications as smart materials in micro-devices, sensors, EMI shielding materials, and wearable electronics.

SEEKING FOR COLLABORATION WITHIN

carbon materials, polymer matrix composites, biomolecule detection, smart materials, energy storage

RELEVANT PROJECTS

NCBR funded project

Professor
Ewa Schab-Balcerzak
LABORATORY OF ENGINEERING FUNCTIONAL MATERIALS

CENTRE OF POLYMER AND CARBON MATERIALS, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES
ESCHAB-BALCERZAK@CMPW-PAN.PL
+48 32 271 60 77 (EXT. 112)

EXPERTISE

Our laboratory is focused on modifying the structure of dye-sensitized solar cells and their preparation methods in order to improve their photovoltaic performance. Ongoing research includes synthesizing new organic compounds and their application as metal-free light-absorbing dyes, developing polymers for the preparation of cathodes, and preparing layers of inorganic materials, for instance in order to reduce light loss or reduce charge recombination processes within the device.

SEEKING FOR COLLABORATION WITHIN

photovoltaic, dye-sensitized solar cells, metal-free dyes synthesis, flexible solar cells

PhD, Associate Professor
Piotr Krzywiec
SEISMIC INTERPRETATION AND BASIN ANALYSIS RESEARCH GROUP (SEISSED)

INSTITUTE OF GEOLOGICAL SCIENCES, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES
PIOTR.KRZYWIEC@TWARDA.PAN.PL
+48 502 412 126

EXPERTISE

Our research, mostly based on seismic reflection data, is focused on regional analysis of sedimentary basins, the structure and evolution of fold-and-thrust belts, on salt tectonics, and on the interplay of tectonic and sedimentary processes. We combine seismic data interpretation (Kingdom Suite) with seismic forward modelling (Tesseral), cross-section balancing (MOVE) and basin modelling (BasinMod, Dionysos). We currently work on data from Poland, China, Australia, offshore East Africa and Gabon.

SEEKING FOR COLLABORATION WITHIN

fold-and-thrust belts and foreland basis, salt tectonics, carbonate buildups

Professor
Stanisław Mazur
DEPOSITIONAL SYSTEMS RESEARCH GROUP

INSTITUTE OF GEOLOGICAL SCIENCES, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES

NDMAZUR@CYF-KR.EDU.PL

+48 668 581 910

EXPERTISE

We combine potential field geophysics with seismic and geological data for basic and applied studies. We are interested in tectonics, structural geology in relation to fold-and-thrust belts, sedimentary basins, and passive continental margins. We conduct research related to prospecting for critical raw materials and the geohazard impact on critical infrastructure. Our experience in geophysics and geology allows to create integrated geosystem models at various scales and levels of precision.

SEEKING FOR COLLABORATION WITHIN

geophysics, critical raw materials prospection, tectonics, structural geology, seismology

Professor
Arkadiusz Derkowski
CLAY MINERALS RESEARCH GROUP

INSTITUTE OF GEOLOGICAL SCIENCES, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES

NDDERKOW@CYF-KR.EDU.PL

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EXPERTISE

The ClayLab is one of few in the world and the only one in Poland laboratory fully equipped with all tools used to study clay minerals and other layered aluminosilicates. Experimental and analytical facilities are employed in pursuing questions in paleogeography, thermal transformations of clay minerals, and clean energy transition, including nuclear waste disposal, CO2 sequestration, natural H2 exploration. The team develops its own methodology to analyze qualitative and quantitative composition of sedimentary rocks and soils, and the properties of clay materials.

SEEKING FOR COLLABORATION WITHIN

nuclear waste disposal, CO2 sequestration, natural H2 exploration, clay minerals, analysis of sedimentary rocks

RELEVANT PROJECTS

NCN no. 2019/35/D/ST10/02814

NCN no. 2025/57/B/ST10/01022

NCN no. 2020/37/B/ST10/01697

NCN no. 2021/41/B/ST10/01951

Professor
Bartłomiej Witkowski
GROUP OF PHYSICS OF OXIDE STRUCTURES

INSTITUTE OF PHYSICS, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES

BWITKOW@IFPAN.EDU.PL

+48 22 116 33 41

EXPERTISE

Our group specializes in the production and characterization of a variety of oxide nanostructures in the form of layers (i.e. TCO layers, barrier coatings) and nanorods (an excellent base for biosensors, active element of PV cells, or base for quantum structures). We rely mainly on Atomic Layer Deposition (ALD) and hydrothermal technologies, with which we have many years of experience.

SEEKING FOR COLLABORATION WITHIN

PV cells, transparent conductive oxides (TCO), quantum structures, surface-enhanced Raman spectroscopy

RELEVANT PROJECTS

NCN projects

Ministry of Science and Higher Education projects

EAgLE

NCBR projects (TECHMATSTRATEG, POIR, POIG, PBS)

Professor
Ksenia Pazdro
MARINE CHEMISTRY & BIOCHEMISTRY DEPARTMENT

INSTITUTE OF OCEANOLOGY, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES

PAZDRO@IOPAN.PL

+48 58 731 19 39

EXPERTISE

The Marine Biogeochemistry Laboratory is focused on C, N, P, O cycling in the marine environment.

SEEKING FOR COLLABORATION WITHIN

marine CO_2 system, ocean acidification, biological pump, land-ocean continuum

RELEVANT PROJECTS

BONUS INTEGRAL

ICOS

RAW

BONUS PINBAL

Professor
Jacek Piskozub
PHYSICAL OCEANOGRAPHY DEPARTMENT

INSTITUTE OF OCEANOLOGY, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES

PISKOZUB@IOPAN.PL

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EXPERTISE

The Department of Physical Oceanography is focused on ocean–atmosphere interactions, particularly mass, energy, and radiation fluxes in the ocean–atmosphere boundary layer; spatial and temporal variability of circulation and properties of water masses in the Baltic Sea, Nordic Seas, and European Arctic; oceanic fluxes of mass, heat, and salt and t heir role in shaping the ocean climate and Arctic sea ice cover; climate feedbacks with a focus on the role of oceanic processes in intra-seasonal to decadal cryospheric and atmospheric variability and predictability; numerical experiments with ocean circulations.

SEEKING FOR COLLABORATION WITHIN

ocean-atmosphere interactions, oceanic fluxes of mass, heat and salt, ocean circulation

RELEVANT PROJECTS

HiAOOS

RISE

Intaros

Professor
Mirosław Darecki
MARINE PHYSICS DEPARTMENT

INSTITUTE OF OCEANOLOGY, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES

DARECKI@IOPAN.PL

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EXPERTISE

The main research areas are marine optics, bio-optics, remote sensing, and acoustics. We have expertise in conducting optical measurements and analyzing optical and remote sensing data in various marine environments, in developing optical methods for investigating biological and physical processes in the sea and remote sensing algorithms for retrieval of water constituents, and in devising hydroacoustic techniques for classifying benthic habitats, seabed morphometry, and biological organisms.

SEEKING FOR COLLABORATION WITHIN

development of hydroacoustic classification techniques to monitor marine ecosystems and environment

RELEVANT PROJECTS

CHEMSEA

GAME

MODUM

GLAERE

Professor
Marek Zajączkowski
DEPARTMENT OF PALEOCEANOGRAPHY

INSTITUTE OF OCEANOLOGY, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES
TRAPPER@IOPAN.PL
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EXPERTISE

Our Department is focused on the past climate and oceanographic changes in the shelf and deep-water ecosystems. These studies include the multidimensional reconstruction of the postglacial ocean circulation in the Nordic Seas using sea surface temperature, water column stratification and ventilation, and temperature and salinity at the bottom. We use a broad range of different mic-ropaleontological proxies, such as foraminifera, as well as innovative methods like ancient DNA and biomarkers.

SEEKING FOR COLLABORATION WITHIN

paleoceanography, ancient DNA, Nordic Seas, Arctic, carbon burial, productivity, Foraminifera

RELEVANT PROJECTS

BioOcean 5D

NEEDED

Professor
Dorota Gryko
LABORATORY OF SUSTAINABLE CATALYSIS

INSTITUTE OF ORGANIC CHEMISTRY, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES
DOROTA.GRYKO@ICHO.EDU.PL
+48 22 343 20 51

EXPERTISE

Our laboratory is focused on sustainable chemistry. In particular, we develop catalytic methods that mimic the efficiency that is characteristic of enzymes by combining the robust nature of simple nature--derived catalysts with light as the source of energy. We are interested in finding strategies for efficient organic synthesis in accordance with the principles of green chemistry. We also work on vitamin B12, fo- cusing on its catalytic properties and using it as a drug delivery vehicle.

SEEKING FOR COLLABORATION WITHIN

bioorthogonal chemistry, DFT calculations, artificial intelligence, drug delivery, vitamin B12

RELEVANT PROJECTS

BioRed

PhD
Marcin Lindner
LABORATORY OF FUNCTIONAL AROMATIC COMPOUNDS

INSTITUTE OF ORGANIC CHEMISTRY, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES
MARCIN.LINDNER@ICHO.EDU.PL
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EXPERTISE

Our laboratory is focused on the synthesis of fun- ctional aromatic compounds with prospective optoelectronic applications. In particular, we are in- terested in new synthetic pathways towards concave ambipolar N-doped polycyclic aromatic hydrocarbons (N-PAHs) and curved nanographene fragments. These are rationally designed as efficient emitters for thermally activated delay fluorescence (TADF) OLED devices as well as hole transporting layers (HTL) in perovskite solar cells (PSC).

SEEKING FOR COLLABORATION WITHIN

organic synthesis, N-doped PAHs, curved aromatics, functional nanographenes, OLED emitters, HTLs

RELEVANT PROJECTS

NCBR funded project – LIDER

NCN/OPUS23

Professor
Agnieszka Szumna
MOLECULAR RECOGNITION GROUP

INSTITUTE OF ORGANIC CHEMISTRY, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES

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EXPERTISE

Our laboratory is focused on the design and synthesis of supramolecular systems, capsules, cavitands, and macrocycles. In particular, we are interested in their host–guest binding abilities, chiral recognition, and photophysical properties. We investigate interactions of macrocyclic compounds with peptides and proteins. We also carry out mechanochemical synthesis and encapsulation.

SEEKING FOR COLLABORATION WITHIN

imaging, PET, drug delivery, protein interactions

RELEVANT PROJECTS

NCN/OPUS21

NCN/OPUS25 2023/49/B/ST5/02466

Professor
Janusz Lewiński
COORDINATION METAL COMPLEXES AND FUNCTIONAL MATERIALS

INSTITUTE OF PHYSICAL CHEMISTRY, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES

JLEWINSKI@ICHF.EDU.PL

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EXPERTISE

My research is aimed at developing heavy-metal-free quantum dots for solar-driven chemistry, sensing & biomedicine, and compositional engineering of metal halide perovskites for next-generation solar cells and energy storage devices. The preparation approaches rely on classical wet methods and mechanochemical solvent-free synthesis.

Collaboration: Prof. Michael Greatzel (EPFL) and Prof. Władysław Wieczorek (Warsaw University of Technology).

SEEKING FOR COLLABORATION WITHIN

coordination chemistry, nanoscience & nanotechnology, perovskites & photovoltaics, mechanochemistry

RELEVANT PROJECTS

GOTSolar

NCN/MAESTRO

PhD, DSc
Stanisław Lewiński
EARTH OBSERVATION DIVISION

SPACE RESEARCH CENTRE, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES

STLEWINSKI@CBK.WAW.PL

+48 22 496 62 86

EXPERTISE

The Earth Observation Division specializes in remote sensing, with a special focus on: • the Environment – monitoring of land and marine waters at the local and regional level, assessing the human impact on the environment, satellite climatology • Security and Crisis Management – assessing the risk of natural disasters (floods, fires) using satellite technology (monitoring developments in time), border control, planning large events • Spatial Planning • Education

SEEKING FOR COLLABORATION WITHIN

environment, satellite data, climatology

RELEVANT PROJECTS

EOTiST

MAIL

PhD
Agnieszka Ciemięga
LABORATORY OF FUNCTIONAL MATERIALS AND MICROREACTORS

INSTITUTE OF CHEMICAL ENGINEERING, PAS
DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES
CIEMIEGA@IICH.GLIWICE.PL
+48 32 234 69 15

EXPERTISE

The work of our laboratory is focused on the synthesis of advanced nanoporous materials and their applications in catalysis or sorption processes. Recently, our research interests have concentrated on developing highly effective monolithic microreactors for the continuous production of organic compounds in the liquid phase. We are experienced in surface modification with organic/inorganic moieties and characterization of structural, physicochemical, and catalytic properties of materials.

SEEKING FOR COLLABORATION WITHIN

microreactors, porous materials, catalysis

RELEVANT PROJECTS

INTERACT
NCN funded project
NCN funded project

PhD
Anna Pawlaczyk-Kurek
LABORATORY OF GAS AND LIQUID SEPARATION

INSTITUTE OF CHEMICAL ENGINEERING, PAS
DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES
ANIA.PAWLACZYK@IICH.GLIWICE.PL
+48 32 234 69 15

EXPERTISE

Our specialization is chemical engineering. We work on separating gas mixtures by adsorption and membrane methods as well as sorption tests of gases on different materials. We concentrate especially on biogas enrichment and carbon dioxide capture. Our scientific interests also focus on different lean methane–air mixture utilization methods, es- pecially thermal combustion in thermal reversal reactors. We are interested in catalytic and thermal reactors, and kinetic studies of reactions.

SEEKING FOR COLLABORATION WITHIN

greenhouse gasses, gas purification, biogas upgrading, chemical reactor engineering, CCUS

RELEVANT PROJECTS

INTERACT
KIC Innoenergy/SECoal
KIC Innoenergy/ACoPP
ProVAM

PhD
Marzena Iwaniszyn
LABORATORY OF STRUCTURAL CATALYTIC REACTORS

INSTITUTE OF CHEMICAL ENGINEERING, PAS
DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES
MIWANISZYN@IICH.GLIWICE.PL
+48 32 234 69 15

EXPERTISE

Our main research activities focus on the characterization of catalytic reactors for processes such as catalytic oxidation of methane and volatile organic compounds, selective catalytic reduction of nitrogen oxides, and hydrogen sulfide utilization. We conduct experimental investigations as well as CFD modelling of fluid flow, heat and mass transfer, and catalytic and kinetic studies. We are particularly interested in novel catalyst supports manufactured by 3D printing methods.

SEEKING FOR COLLABORATION WITHIN

chemical reactor engineering, catalytic reactors, CFD modelling, air purification

RELEVANT PROJECTS

INTERACT
NCN funded project
NCN funded project
NCN funded project
ProVAM

Professor
Wiesław Bujakowski
DIVISION OF RENEWABLE ENERGY SOURCES

MINERAL AND ENERGY ECONOMY RESEARCH INSTITUTE, PAS
DIVISION IV - ENGINEERING SCIENCES
W.BUJAKOWSKI@MIN.PAN.KRAKOW.PL
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EXPERTISE

The RES laboratory focuses on research related to geothermal energy. We are particularly interested in research on the recognition and use of geothermal waters for energy purposes. Our work aims to optimize the use of low-temperature renewable energy resources, common in Poland. In addition, these tests are combined with the assessment of the quality of geothermal waters in terms of their use in agriculture, medicine and balneotherapy.

SEEKING FOR COLLABORATION WITHIN

technologies for construction geothermal wells, water reinjection, desalination of geothermal waters

RELEVANT PROJECTS

User4GeoEnergy
Geo4Food
KeyGeothermal
EnerGizers

Professor
Lidia Gawlik
DIVISION OF MINERALS AND ENERGY SUSTAINABLE DEVELOPMENT

MINERAL AND ENERGY ECONOMY RESEARCH INSTITUTE, PAS
DIVISION IV - ENGINEERING SCIENCES
LIDIA.GAWLIK@MIN-PAN.KRAKOW.PL
+48 507 148 120

EXPERTISE

Our division is focused on research related to energy policy, energy consumption, and mobility. In particular, we are interested in projects related to the energy transition and its consequences. Our research team has extensive experience in the modeling of energy systems. We work on the social, economic, technical, environmental, and legal aspects of energy and mineral resources, including fossil fuels, renewable energy sources, clean trans-port, and green hydrogen.

SEEKING FOR COLLABORATION WITHIN

energy policy, energy transition, coal regions, renewable energy, green hydrogen, coal regions

RELEVANT PROJECTS

ENTRANCES
TANDEM
KAWSOL
DTA

Professor
Magdalena Wdowin
DIVISION OF APPLIED GEOCHEMISTRY AND ENVIRONMENTAL ENGINEERING

MINERAL AND ENERGY ECONOMY RESEARCH INSTITUTE, PAS
DIVISION IV - ENGINEERING SCIENCES
WDOWIN@MEERI.PL
+48 12 617 16 57

EXPERTISE

Our division is focused on waste management activities. In particular, we are interested in field of environmental pollution removal using solid sorbents. We work on the synthesis of aluminosilica micro/mesoporous materials from silica wastes and using them for the purification of gases and wastewaters as well as for gas storage (H2) and capture (CO_2). We have extensive experience in mineralogical, chemical, textural, and geochemical analysis as well as the investigation of sorption properties.

SEEKING FOR COLLABORATION WITHIN

utilization of fly ash and aluminosilicate waste, purification of gases and wastewaters, H2 storage

RELEVANT PROJECTS

ZIF-X-CARBON
GeoReco
SFZCHSA
CO2ZeoCap

Full Professor

Dariusz Kardaś

CENTRE OF FLOW AND COMBUSTION / RENEWABLE ENERGY DEPARTMENT

INSTITUTE OF FLUID-FLOW MACHINERY, PAS

DIVISION IV - ENGINEERING SCIENCES

DK@IMP.GDA.PL

+48 58 522 51 66

EXPERTISE

Our team specializes in studying combustion and gasification phenomena and designing heat and power cogeneration systems. We conduct theoretical analyses and model flow processes involving phase transformations and chemical reactions, utilizing CFD and DEM calculations. Our work includes thermo-chemical measurements of pyrolysis, combustion, and heat transfer phenomena. We design and analyse burners, synthetic fuel reactors, heat exchangers, and power systems for rocket engines.

SEEKING FOR COLLABORATION WITHIN

particulate matter separation, syngas to liquids catalysis, surface reactions, combustion

RELEVANT PROJECTS

ResMe2E

Associate Professor

Paweł Flaszyński

CENTRE OF FLOW AND COMBUSTION / AERODYNAMICS DEPARTMENT

INSTITUTE OF FLUID-FLOW MACHINERY, PAS

DIVISION IV - ENGINEERING SCIENCES

PFLASZYN@IMP.GDA.PL

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EXPERTISE

Our Aerodynamics Department has participated in many EU projects in aviation (turbomachinery and drag reduction), UAV propulsion and wind energy (turbine blades, wake steering and wind farm interactions). The research is focused on flow structure, heat transfer, boundary layer transition and separation, shock wave boundary layer interaction, flow control and noise reduction. Flaszyński has coordinated the EU FP7 TFAST project and H2020-MSCA-ITN TEAMAero.

SEEKING FOR COLLABORATION WITHIN

gas turbine, compressor, wind turbine, wind farm, flow control, heat transfer, aeroacoustics

RELEVANT PROJECTS

H2020-MSCA-ITN TEAMAero

HORIZON-EIC-2023-PATHFINDEROPEN-01 BEALIVE

H2020-MG-2016-2017 SMS

H2020-MSCA-ITN zEPHYR

MSc. Eng.

Sebastian Bykuć

CENTRE OF HEAT AND POWER ENGINEERING / DEPARTMENT OF DISTRIBUTED ENERGY AND RES / KEZO RESEARCH CENTRE

INSTITUTE OF FLUID-FLOW MACHINERY, PAS

DIVISION IV - ENGINEERING SCIENCES

SBYKUC@IMP.GDA.PL

+48 58 522 51 44

EXPERTISE

The team has experience with planning, modelling and management of energy systems (EnergyPro, EnergyPLAN; TRNSYS, PVsyst, Simulink), with analysis of heat/electricity demand in cities and municipalities using limited data (GIS tools, fuzzy analysis), integration of RES, EV and energy storage systems (real world demonstrators), and with aspects such as energy sector coupling, PV, wind turbines, heatpumps, CHP testing, heat and electricity storage testing, CFD analysis (Ansys), V2G technologies.

SEEKING FOR COLLABORATION WITHIN

energy communities, V2X, spatial analysis, fuzzy processing, decarbonization of heating, RES integration

RELEVANT PROJECTS

SERENE

SUSTENANCE

HYPERGRYD

LOCALISED

V4Grid

PhD, DSc, Eng.

Adam Dębski

LABORATORY OF METALLURGICAL PROCESSES

INSTITUTE OF METALLURGY AND MATERIALS SCIENCE, PAS

DIVISION IV - ENGINEERING SCIENCES

A.DEBSKI@IMIM.PL

+48 12 295 28 16

EXPERTISE

Our scientific interests focus on the thermodynamic and physicochemical properties of materials for energy and hydrogen storage. Especially, we are interested in the thermodynamic properties of magnesium alloys and their ability to interact with hydrogen. We conduct calorimetric studies of the formation enthalpy of intermetallic phases and the mixing enthalpy change of liquid, which we use to calculate of phase diagrams.

SEEKING FOR COLLABORATION WITHIN

metals and alloys, thermodynamic properties, materials for hydrogen storage in the solid phase

RELEVANT PROJECTS

NCN/NCBR

PhD, DSc

Kazimierz Drabczyk

PHOTOVOLTAIC LABORATORY

INSTITUTE OF FLUID-FLOW MACHINERY, PAS

DIVISION IV - ENGINEERING SCIENCES

K.DRABCZYK@IMIM.PL

+48 33 817 42 49

EXPERTISE

Our ILAC-accredited Photovoltaic Laboratory focuses on diagnostics of PV modules and solar cells and researching technological processes used in the photovoltaic industry. Research on module manufacturing technologies focuses on new materials for encapsulation, luminescent concentrators, and glassless PV modules for BIPV. We also study materials and processes for tandem solar cells.

SEEKING FOR COLLABORATION WITHIN

luminescent solar concentrators, tandem solar cells, determining PV modules' I-V characteristics

RELEVANT PROJECTS

IN-LINE

WOLTER

EPF

PV innovations

Professor

Anna Wysocka

DEPOSITIONAL SYSTEMS RESEARCH GROUP (DEPOS)

INSTITUTE OF GEOLOGICAL SCIENCES, PAS

DIVISION III - MATHS, PHYSICS, CHEMISTRY, EARTH SCIENCES

ANNA.WYSOCKA@TWARDA.PAN.PL

+48 888 496 122

EXPERTISE

DEPOS conducts research on depositional systems from various perspectives and on various scales: from understanding the origin of sedimentary rocks, their depositional environment, paleoenvironmental and paleoclimatic conditions, and subsequent transformations, to reconstructing the provenance of clastic material, analyzing sedimentary basins, and recognizing the architecture of depositional systems. We use both classical and modern interdisciplinary research combining sedimentology with petrographic, mineralogical, and geochemical methods.

SEEKING FOR COLLABORATION WITHIN

analysis of sedimentary basins, provenance of clastic material, bioturbation, diagenesis

RELEVANT PROJECTS

NCN no. 2018/29/N/ST10/02028

NCN no. 2024/53/B/ST10/03806

NCN no. 2024/53/B/ST10/03806

Professor

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EVIRONMENTAL CHANGE - CLIMATE AND HUMAN (PALEO)

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EXPERTISE

The PALEO research group conducts studies focusing on the environmental changes, evoked by natural factors such climate changes as well as human presence and activity. The studies concern on the processes and phenomena occurring in the last several hundred thousand years (during the Quaternary period). The environmental reconstructions are based on the multi-proxy analyses of lake, peat bog and cave sediments, using the biological (pollen, diatoms, cladocerans, vertebrates, macrofossils) and geochemical (organic matter, stable isotopes) methods as well the archaeological data.

SEEKING FOR COLLABORATION WITHIN

environmental changes, diatomological and palynological analysis, geochemical and isotopic sediment analyses

RELEVANT PROJECTS

NCN no. 2023/49/B/ST10/03175

NCN no. 2021/43/B/HS3/02636

NCN Minitura no. 2021/05/X/ST10/00774

NCN Miniatura no. 2017/01/X/ST10/01216

NCN no. 2012/05/B/ST10/00469