Jakub Smoleń, PhD, Eng. (Dr inż.)

Assistant Professor, Silesian University of Technology | Patent Attorney Trainee (Reg. No. 20250764) | Head of NovaMater Research Group

Research Fields: Polymer & Fiber-Reinforced Composites • Circular Economy & Composite Recycling • Tribology • Environmental Aging • Industrial R&D & IP Protection

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> **Speaker & Career Profile:** Materials scientist and R&D project leader bridging academic research with industrial implementation and intellectual property protection. Principal Investigator in major national and international grants (NCBR LIDER XV, Diamond Grant, Research in Svalbard COM-POLAR) and Scientific Mentor for young innovators (Uczelnie Przyszłości, LIDER UP). Author of **scientific publications**, co-inventor of **patent applications**, and leader of industrial R&D deployments across the composites, plastics manufacturing, and mining sectors.

PROFESSIONAL & INDUSTRIAL CAREER PATH

Period	Position, Organization & Scope of Responsibilities
07.2025 – present	**Assistant Professor (Researcher)** — Silesian University of Technology, Poland
10.2024 – present	**Patent Attorney Trainee** — Polish Chamber of Patent Attorneys (Entry No. 20250764). Bridging scientific innovation, industrial R&D, and intellectual property protection.
07.2022 – 12.2022 **02.2023 – 08.2023**	**R&D Specialist (Research & Development Cooperation)** — NEW ERA MATERIALS Sp. z o.o. (Modlniczka) Composite manufacturing (hand lay-up with vacuum bag, infusion, autoclave, high-temperature pressing) and testing (3D optical microscopy, DSC, DMTA, ILSS, tensile/flexural strength, environmental aging).
2017 – 2020 **(3 internships)**	**Industrial Intern: CAD/CAM Designer** — FORMES TOYS (Wręczyca Wielka) (07–09.2017, 07–09.2019, 02–09.2020) 3D design of plastic products and injection molds (SOLIDWORKS, Autodesk Inventor, CATIA), injection molding and strength simulations, technical documentation, and mechanical recycling of contaminated plastic waste.
07.2018 – 08.2018	**Industrial Intern: Quality Control & Production** — Odlewnia Żeliwa Simiński-Ordon Sp. z o.o. (Poczesna) Quality control of cast iron products (molding sand testing, mechanical & spectroscopic analysis), CAD design, and casting process simulations.

SCIENCE–INDUSTRY COOPERATION & TECHNOLOGY TRANSFER

- **Industrial Implementation (09.2020) — ZPHU Formes Toys (Wręczyca Wielka):** Full-scale deployment of an innovative mechanical recycling process and production reuse technology for contaminated and mixed plastic manufacturing waste.
- **Jastrzębska Spółka Węglowa S.A. (01.2024 – 05.2024):** Contractor in the industrial R&D project developing design assumptions and prototype series of lightweight fiber-reinforced composite V29 support profiles to reduce component mass in underground mining.
- **New Era Materials Sp. z o.o. (Modlniczka near Kraków):** Joint R&D on UV and aquatic degradation of fiber-reinforced polymer composites, surface protection systems against photodegradation, and structural repair methods for degraded laminates.
- **ANMET Andrzej Adamcio (Szprotawa):** R&D on pyrolytic recycling of end-of-life fiber-reinforced composites (including wind turbine blades) and industrial reuse of recovered/chopped carbon fibers (rCF) in new composite structures.
- **Patent Applications (Patent Office of the Republic of Poland — UP RP):**
  - **P.439175 (2021):** J. Smoleń, M. Chudy — *Device for automatic determination of resin gelation time and temperature characteristics of the crosslinking process* (Applicant: ZPHU Formes Toys Grzegorz Chudy).
  - **P.443317 (2022):** J. Smoleń, B. Nowacki, P. Olesik, T. Pawlik, M. Kozioł — *Method for assessing UV resistance of liquid-immersed samples and device for its implementation* (Applicant: Silesian University of Technology).

KEY RESEARCH GRANTS & SCIENTIFIC MENTORSHIP

Timeline	Role, Funding Program & Project Scope
07.2025 – 07.2028	**Principal Investigator — LIDER XV (NCBR, LIDER15/0265/2024):** *Assessment of possibilities and development of guidelines for achieving a closed material loop in the production process of polymer-fiber prepregs.*
09.2026 – 09.2029	**Principal Investigator — Research in Svalbard, Norway (COM-POLAR, RiS ID 12912):** *Long-term environmental degradation of polymer-fiber composites (CFRP and GFRP) in the Arctic climate.*
01.2026 – 11.2028	**Scientific Mentor — "Uczelnie Przyszłości" & LIDER UP (NCBR, FERS.05.01IZ.00-0080/24):** Mentoring young researchers and students in social and technological innovation projects and grant leadership.
10.2020 – 07.2024	**Principal Investigator — Diamond Grant (Diamentowy Grant, DI2019 017749):** *Polyepoxy composites reinforced with carbon components for tribological applications.*
2021 – 2023	**Principal Investigator — 5 Targeted & Innovation Grants:** Two international EURECA-PRO STEM Innovation Contest projects (2022: sustainable materials from hazardous chemical by-products; 2023: bicycle safety & security) and three SUT Young Researcher Grants (filler sedimentation threshold modeling, UV aging of polyester/epoxy resins, and UV protective coatings for GFRP). Earlier Contractor in NCBR GEKON project *EKOKERAMZYT* (2015–2017).

INTERNATIONAL MOBILITY & ACADEMIC NETWORK

- **Foreign Research Internships:** Polish Polar Station Hornsund, Svalbard, Norway (08–09.2026); Technical University of Crete, Greece (06.2026); Vilnius Gediminas Technical University – VILNIUS TECH, Lithuania (09.2024); Erasmus+ Traineeship in León, Spain (07–09.2023); University of Ljubljana, Slovenia (08.2022).
- **International & National Research Partners:** McMaster University (Canada — statistical & techno-economic feasibility analysis), Politecnico di Milano (Italy), Gebze Technical University (Turkey), Technical University of Crete (Greece), VILNIUS TECH (Lithuania), University of Ljubljana (Slovenia), Centre of Polymer and Carbon Materials PAS (CMPW PAN), Warsaw University of Technology, Wrocław University of Science and Technology, Opole University of Technology, University of Silesia.

SELECTED PUBLICATION

- **Smoleń J.** et al. (2024). "Utilization of lightweight ceramic aggregates based on waste materials in the production of lightweight polymer concrete as a component of sustainable architecture." *Scientific Reports*, 14(1), 29384.
- **Smoleń J.** et al. (2024). "Study of resin coating adhesion on GFRP laminate surfaces after UV degradation." *International Journal of Adhesion and Adhesives*, 103841.
- **Smoleń J.** et al. (2024). "The Influence of UV Radiation on the Properties of GFRP Laminates in Underwater Conditions." *Scientific Reports*, 14, 1–11.
- **Smoleń J.** et al. (2024). "Tribological Properties of Composites Based on Single-Component Powdered Epoxy Matrix Filled with Graphite." *Materials*, 17(13), 3054.
- Stępień K., **Smoleń J.** et al. (2026). "Mechanical recycling of single-component powdered epoxy prepreg waste for applications in polymer concretes." *Advances in Science and Technology Research Journal*, 20(5), 202–212.
- **Smoleń J.** et al. (2022). "The Use of Carbon Fibers Recovered by Pyrolysis from End-of-Life Wind Turbine Blades in Epoxy-Based Composite Panels." *Polymers*, 14, 2925.

DISTINCTIONS, CERTIFICATIONS & SCIENTIFIC SERVICE

- **Major Awards:** 1st Place in the International *EURECA-PRO STEM Innovation Contest* (twice: 2022 & 2023); *Omnium Studiosorum Optimo* Medal for the Best Graduate of the Silesian University of Technology (2020); Finalist of *Studencki Nobel 2020* in Technical Sciences; Scholarship of the Minister of Science and Higher Education (2019/2020); Rector's Award of the Silesian University of Technology.
- **Industry & Management Qualifications:** Certified Internal Auditor of Quality Management Systems (ISO 9001:2015); Project Management Certificate (Project Management Center, SUT); Team Management Certificate; Certified CNC Machine Operator.
- **Community & Leadership:** Co-organizer of the International Scientific Conference *"Materials and Technologies of the 21st Century"* (2015–present); Member of the Polish Society of Composite Materials (PTMK); Member of Student Science Club *Mater-Tech* (2015–2025); Erasmus+ research supervisor for international trainees.