# NAZIM EGE ERDEMIR

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## PROFILE

M.Sc. student in Materials Engineering at RWTH Aachen, specialising in Materials Physics and Design. Lab research experience since 2023 in materials synthesis and characterization (SEM/EDX, DSC, TGA, FT-IR). Co-author of one peer-reviewed journal paper. Uses Python for data analysis and machine learning. Looking for a student assistant (HiWi) position of 8 to 10 hours per week in materials research or materials data science.

## EDUCATION

**M.Sc. Materials Engineering (International Profile)** *Oct 2025 – present*

*RWTH Aachen University, Germany. Specialisation: Materials Physics and Design*

- Completed: Materials Physics and Design II, Introduction to Data Mining and Machine Learning, Materials Physics, Materials Chemistry II, Surface Engineering for Corrosion Protection
- Current (winter 2026/27): Materials Physics and Design I, Materials Data Science and Informatics, Fundamentals of Microscopy and Diffraction with Electrons and X-rays, Materials Physics Lab, Entrepreneurship 101

**B.Sc. Materials Science and Nano Engineering** *Aug 2018 – Jan 2025*

*Sabancı University, Istanbul, Turkey. Faculty of Engineering and Natural Sciences*

## PROJECTS

**Tiny-Object Detection in Drone Imagery (independent project)** *Sep 2026*

- Trained YOLO11s object detectors in Python on the VisDrone dataset (7,000+ images, 4 classes) on cloud A100 GPUs
- Raised detection accuracy from 52.8 % to 70.0 % mAP50 by training at 1280 px instead of 640 px
- Used sliced inference (SAHI) to raise recall for very small objects (< 16 px) from 6.5 % to 24.4 %

## PUBLICATIONS

Kölgesiz, S.; Özçelik, N.; **Erdemir, N. E.**; Ünal, H. Hybrid Pectin/Polydopamine Hydrogels with Photothermal Properties. *ACS Omega* 2025, 10 (21), 21994–22004. DOI: 10.1021/acsomega.5c02084

## RESEARCH EXPERIENCE

**Research Assistant, Graduation Project** *Jan 2024 – Jan 2025*

*Sabancı University Nanotechnology Research Center (SUNUM), Istanbul*

- Developed a photothermal hydrogel with antimicrobial properties for wound care
- Optimized the synthesis and characterized the gels by SEM/EDX, rheology, UV-Vis and FT-IR
- Results published in ACS Omega (2025), see Publications

**Research Intern** *Jul 2024 – Aug 2024*

*Materix Nanotechnology, Istanbul*

- Developed and refined nanocoating products for hydrophobic and superhydrophobic surfaces
- Wrote a review article on nanocoating technologies for the company and its customers

**Research Assistant** *Jun 2023 – Jan 2024*

*Sabancı University Nanotechnology Research Center (SUNUM), Istanbul*

- Contributed to bio-based antimicrobial packaging to extend the shelf life of fermented foods (TÜBİTAK-funded project)

**Project Assistant, Spray Dryer Design** *Jul 2023 – Sep 2023*

*Faculty of Engineering and Natural Sciences, Sabancı University, Istanbul*

- Designed atomizer parts in SOLIDWORKS and ran the spray drying of ceramic granules, including powder handling and quality control

## SKILLS

**Characterization:** SEM/EDX, DSC, TGA, DTA, FT-IR, UV-Vis, rheology
**Programming & data:** Python (Jupyter, NumPy, pandas, scikit-learn, Ultralytics YOLO), MATLAB, data analysis
**Software:** SOLIDWORKS, Origin, ImageJ, TA Universal Analysis, Mendeley, VS Code
**Languages:** Turkish (native), English (C1), German (A1, currently learning)

## ACTIVITIES & REFERENCES

Board member and treasurer of the Sabancı University Music Club (2019 to 2024, over 2,000 members), handling sponsorship deals with Red Bull and Nescafé. Board member of the Game Development Club (2019 to 2023).
Reference: Assist. Prof. Dr. Hatice Sinem Şaşçaycı, Sabancı University, haticesas@sabanciuniv.edu