EXPRESSION OF INTEREST FORM

This Expression of Interest (EOI) document has been prepared to enable researchers of Istanbul Technical University (ITU) to be rapidly and effectively included in existing and potential consortia, primarily within the scope of Horizon Europe and other International Programmes.

The information collected through this form will be used by the ITU International Projects Office for the following purposes:

- Matching researchers with ongoing consortium searches,
- Communication with international project partners,
- Targeted invitations and information dissemination for relevant calls.

Contact Person/Scientist in charge **Name** *(data of the principal investigator of the research group/lab or scientific supervisor)*	Ozgen U.
Surname	Colak Cakir
Email	cakirou@itu.edu.tr
Laboratory /Department /Institute /Centre / **Name**	Mechanical Engineering
Brief description of the Centre/Research Group (Please provide a brief description of your research group or organisational unit, including research infrastructure, laboratory facilities, team size and industry collaborations.)	My research focuses on nanocomposite manufacturing, advanced characterization, and constitutive material model development for high strain rate applications. I specialize in graphene–epoxy nanocomposites, including controlled dispersion and field-induced orientation techniques, and investigate their mechanical behavior across quasi-static and dynamic loading regimes. A major component of my work involves the development of viscoelastic–viscoplastic material models for polymers and nanocomposites, integrating experimental high strain rate testing with physics-based and data-driven modeling approaches. The overall objective is to establish reliable structure–property relationships and predictive frameworks for impact-resistant and multifunctional composite system. The research infrastructure includes nanocomposite manufacturing facilities (three-roll milling, vacuum casting, and electric field-assisted alignment) and comprehensive mechanical characterization under quasi-static loading. My team comprises PhD and MSc researchers, asistant, associate and full professors working at the interface of materials science and mechanics, with active industry collaborations focused on high-performance polymer and graphene–epoxy nanocomposite applications.
Address	Department of Mechanical Engineering, Ofice: 425, Gumussuyu, Beyoğlu, Istanbul
Research Area (Please provide 5–10 keywords that best describe your research areas and expertise.)	Graphene–Epoxy Nanocomposites Nanocomposite Manufacturing and Processing High Strain Rate Mechanics Split Hopkinson Pressure Bar (SHPB) Viscoelastic–Viscoplastic Material Modeling Polymer Constitutive Modeling Machine Learning in Materials Science

Please list your relevant previous projects, indicating the programme, project name, year and role.	**TÜBİTAK 1001**, Project No: 119M088, *Characterization and Modeling of Nanocomposite Materials at High Strain Rates*, Principal Investigator, 2019–2022 **TÜBİTAK 3001 – Initial R&D Projects**, Project No: 215M031, *Synthesis and Characterization of High-Purity Few-Layer Graphene via the Electric Arc Method*, Researcher, 2015–2017 **International Bilateral Cooperation (CNRS–TÜBİTAK)**, Project No: 113M109, *Manufacturing, Characterization, and Modeling of Graphene-Reinforced PMMA Matrix Nanocomposites*, Principal Investigator, 2013–2015 **TÜBİTAK 1001**, Project No: 108M521, *Modeling of Membranes in Proton Exchange Membrane Fuel Cells Subjected to Hydrothermal Cycling*, Principal Investigator, 2009–2012 **TÜBİTAK 3501 – Career Development Program**, Project No: 104M215, *Determination of Mechanical Behavior of Polymeric Materials and Development of Viscoelastic–Viscoplastic Theories*, Principal Investigator, 2005–2009 **San-Tez (Industry Thesis Project)**, *Development of a Variable Displacement Vane Pump for Commercial Vehicle Steering Systems*, Researcher, 2013–2015 **San-Tez (Industry Thesis Project)**, *Optimization of Crankshaft Bearings and Investigation of Rolling Bearing Applications in Hermetic Compressors*, Principal Investigator, 2012–2014 **San-Tez (Industry Thesis Project)**, *Design, Manufacturing, and Structural Characterization of a Wind Turbine Blade Hub*, Researcher, 2009–2012
Proposed Project Idea or Area of Interest: (If applicable, please briefly outline a concept idea, the problem you aim to address, or your specific area of interest.)	Development of graphene-reinforced polymer nanocomposites for high strain rate and impact applications by integrating advanced manufacturing, multiscale mechanical characterization, and viscoelastic–viscoplastic constitutive modeling. The project aims to establish predictive structure–property relationships and data-driven design frameworks for lightweight, high-performance composite systems.
Potential Contributions to Projects	X Scientific / technical research x Methodology development x Modelling / simulation x Data analysis / artificial intelligence x Experimental studies / testing ☐ Pilot / demonstration activities ☐ Socio-economic analysis / policy contribution ☐ Education, dissemination and impact activities ☐ Other (please specify):

Preferred Role in Consortia	☐ Coordinator x Partner
Programmes and Calls of Interest (Please indicate the programme(s) you are interested in and, if possible, specify the call identifier and/or title.	x Horizon Europe Clusters x Erasmus+ ☐ Digital Europe x EIT (HEI / KIC, etc.) x MSCA ☐ ERC ☐ Other (please specify): Specific call identifier and/or title:
Additional Notes **(**Please provide any additional information or specific remarks you would like to share with the International Projects Office.)	