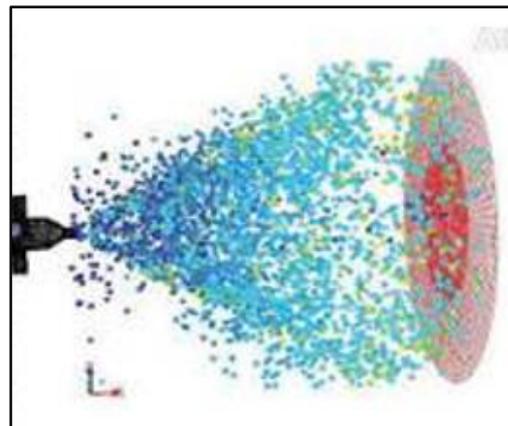
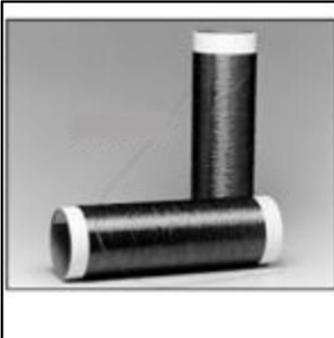


**Ph.D. Students will be hired** for the project entitled “TEI-GTÜ Joint Research on Design, Manufacturing, Test and Analysis of Novel Ceramic Matrix Composites (CMCs) and Fuel Injectors for Efficiency Improvement on Indigenous Aeroengines Recently Developed in Turkey”. This project will be jointly coordinated by GTÜ Energy Technologies Institute management and TEI Chief Engineering Office with the support TÜBİTAK under the Industrial Doctorate Programme (TÜBİTAK 2244).

PhD students will be supervised by Asst. Prof. Mahmut Akşit, Assoc. Prof. Ali Murat Soydan and Prof. Dr. Saim Dinç from ETI of GTÜ and Prof. Dr. İlyas Kandemir from Mechanical Engineering Department (ME) of GTÜ. The Ph.D. students will receive full support for 4 years. They will receive 4500 ₺/month from TÜBİTAK and additional 1000 ₺/month from TEI. The students will be hired by TEI upon the completion of their Ph.D. studies.

Six Ph.D. students will be hired to work on either aeroengine CMCs or aeroengine fuel injectors.

The goal of the CMC track of the project is to develop CMC parts for next generation Turkish aeroengines which will have significantly enhanced trust, fuel efficiency and durability. Produced CMCs are expected to be up to 60% lighter than conventional metallic alloy aeroengine materials such as Inconel 718. Besides providing higher fuel efficiency due to reduced weight, lighter components in aeroengines also significantly reduce mechanical stresses on the fast rotating aeroengine components leading to enhanced durability. The CMC parts are also expected to have dramatically higher oxidation resistance, yield strength and toughness compared to the conventional aeroengine metallic alloys, especially at elevated temperatures. In the CMC track of the project, the PhD students will initially work on developing exotic ceramic fibers that will maintain high strength at high temperatures (>1100 °C). These fibers will then be woven into 2D and 3D structures and infused with ceramic matrices to make CMC parts suitable for the harsh operating conditions of gas turbines. Considering these major tasks, Ph.D. students intending to work on the CMC track of the project are expected to have solid background in fields such as materials science, physics, chemistry, chemical engineering and/or polymer science. Additional experience in mechatronics and manufacturing engineering is preferred.



The fuel injector track of the project aims to produce next generation duplex fuel injectors to be used in future advanced aeroengines that are currently being developed in Turkey. In contrast to conventional simplex fuel injectors, the duplex fuel injectors feature two separate orifices with different sizes. The smaller orifice is optimized for low fuel flow and the larger only activates in need of large fuel consumption. Such duplex orifice structure yields better atomization of the fuel at different flow rates. This results in improved combustion efficiency and stability, easier ignition and optimum outlet temperature distribution for combustion chamber. Therefore, despite many challenges associated with its

complexity, duplex fuel injectors have been employed in nearly all state of the art aeroengines. Research

on duplex fuel injectors involves design architecture selection in the light of literature data, fundamental scaling studies, 3D VOF analysis, 3D mechanical design, prototype production and performance evaluation tests. Ph.D. students with background in mechanical engineering, mechatronics and/or aeronautical/aerospace engineering are suitable for the fuel injector track of the project.

GTÜ's ETI is the host institution for the project. As evident from rankings provided by the national and international higher education evaluators (e.g. URAP and Times Higher Education) GTU is a highly regarded academic institution. Some of the major factors for this achievement are GTU's employee friendly work environment, abundant research infrastructure/equipment, and policies encouraging international academic mobility. Despite being established very recently, ETI has managed to be one of the most active and successful research institutes in GTU. ETI currently hosts TEI-GTU joint masters' degree programme on "Applied Propulsion Engineering for Aviation and Space Technologies". All 55 students with industrial experience from top-notch aviation related industrial organizations are currently registered in this joint programme.

Applicants must submit their applications to [mahmutaksit@gtu.edu.tr](mailto:mahmutaksit@gtu.edu.tr) for the CMC track and [kandemir@gtu.edu.tr](mailto:kandemir@gtu.edu.tr) for the fuel injector track. The applications should be submitted as soon as possible and no later than January 10, 2021. A master's degree in the relevant fields mentioned above is required for the application. Applications should include CV and transcript.

It is preferred for successful applicants to start working as soon as January 30<sup>th</sup>, 2021. However, in order to start working on January 30<sup>th</sup>, 2021, the applicants must apply to Gebze Technical University GTU –ETI PhD Programme before the programme's Spring 2021 application deadline which is January 22<sup>nd</sup>, 2021.

PS: Follow the hyperlinks for detailed information related to [the university](#), [ETI](#), [application guidelines for GTU-ETI PhD programme](#), and the project supervisors [Asst Prof. Aksit](#), [Assoc. Prof. Soydan](#), [Prof. Kandemir](#) and [Prof. Saim Dinç](#).

