

The [Advanced Manufacturing for Energy Devices \(AMED\) Lab](#) in the College of Engineering at San Diego State University (SDSU), led by [Dr. Meysam Heydari Gharahcheshmeh](#), has been featured on the cover of *Advanced Functional Materials* ([Article Number: 2418331](#)). This cover image highlights a significant breakthrough in the utilization of organic conducting polymers for thermoelectric devices, showcasing SDSU's contributions to cutting-edge materials research.

The publication reports a major enhancement in carrier mobility in poly(3,4-ethylenedioxythiophene) (PEDOT) thin films, fabricated using the oxidative chemical vapor deposition (oCVD) method. By employing nanostructure engineering, the research team successfully optimized the π - π stacking distance, achieving a quasi-one-dimensional (1D) charge transport pathway. These advancements have led to significantly improved carrier mobility and thermoelectric performance, demonstrating the versatile potential of oCVD-fabricated PEDOT thin films for next-generation energy and electronic applications. This notable achievement is the result of the outstanding research contributions of M.S. student Brian Dautel and Ph.D. student Kafil Chowdhury, under the supervision of Dr. Meysam in the AMED Lab.

Brian Dautel shared, "It has been an enriching experience to work on the theoretical aspects of carrier mobility in conjugated conducting polymers based on the energy band diagram under the supervision of Dr. Meysam."

Dr. Meysam Heydari Gharahcheshmeh emphasized the impact of his team's recent research, stating, "Conducting polymers fabricated by the oCVD method are particularly well-suited for low-temperature thermoelectric devices due to their ability to form on large-area and flexible substrates, their lightweight nature, and the abundant availability of raw materials compared to their inorganic counterparts." Dr. Meysam also expressed his appreciation for Andres De Casas, who contributed to the project through his special studies research, acknowledging his efforts in assisting with the preparation of the cover image for the publication.

This research underscores SDSU's leadership in advanced manufacturing of energy devices, paving the way for high-performance organic electronics and thermoelectric devices.



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