CURRENT RESEARCH
Interweaving the disciplines of science to head research off with the right questions

Too often scientific research, which is meant to be venturing past the walls of our current understanding of nature, winds up confining itself to a box drawn by the specific discipline it strives to be distinguished within. Scientists aim to discover new phenomena and pen new theories whereas engineers pride themselves on their inventions that benefit humanity. It is rare to come across a researcher like Dr. Federico Capasso of Harvard University, who encompasses both roles and focuses on providing discoveries and inventions that can broadly benefit mankind instead of to any one particular field of science. With this new open-ended approach to research — which is a reprise of how research was approached in the days of the Renaissance — Dr. Capasso tackles larger, more complex projects that occur at the intersection of multiple disciplines, including physics, engineering, materials science and others. Leading with the problem at hand is what has driven Dr. Capasso to design artificial nanomaterials which led him to invent and fabricate the first quantum cascade lasers (QCL), revolutionary light source which have a wide range of applications that benefit mankind. By taking a broader approach to optics and rethinking the ways in which light can be reflected and refracted, Dr. Capasso has invented “flat optics” with the promise of revolutionizing optical technology to include sleek, ultra-thin lenses never seen before. These are only a few examples of the boundless innovation his research has delivered so far.

With more than 40,000 citations to date, and of that, more than 16,000 since 2010, it is evident that Dr. Capasso’s work has been garnering interest exponentially. For his advancement of optical...