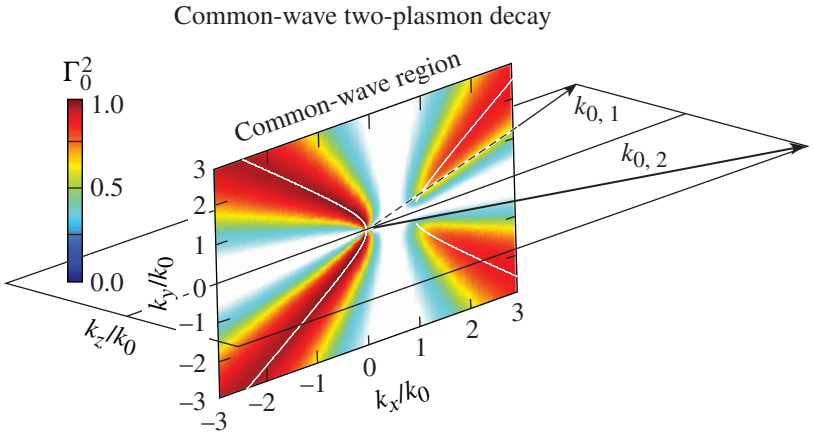
## About the Cover:

The cover photo highlights LLE's scientist Dr. Dustin Froula (right) with his postdoc Dr. Tomline Michel (left) who have led laser–plasma interaction (LPI) experiments on the OMEGA Laser System. Direct-drive ignition is susceptible to LPI's that depend on multiple laser beams. Cross-beam energy transfer (CBET) and two-plasmon decay (TPD) are two such instabilities that are driven by the overlapping multiple laser beams. The CBET instability can reduce the hydrodynamic efficiency, while TPD may reduce the compression efficiency. To gain a thorough understanding of these instabilities in ignition-relevant plasma conditions, a series of LPI experiments has been performed on the OMEGA Laser System. The TPD results indicate that, in general, the hot-electron production depends on the configuration of the laser beams and the sum of the intensities of the beams that share the same angle with the common electron plasma wave. This is explained by recent multibeam TPD growth rate calculations that indicate the maximum gain for TPD exists, in general, outside of the plane defined by the laser beams (figure below). These studies have led to a deeper understanding of the instabilities and to potential mitigation strategies for both CBET and TPD.




TPD growth rates for two laser beams polarized along the common-wave plane ($y$ axis).



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