The Math/Stats Colloquium
Department of Mathematics and Statistics
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A numerical strategy for low-Mach number simulation of flame/electric fields interactions

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Abstract: Applying electric fields to flames can control combustion effectively, but the development of such technologies is impaired by the lack of reliable modeling tools. Numerical simulation of such interactions is very difficult due to the wide time scale separation between the fast motion of the light electrons and the comparatively slow motion of the bulk flow. We introduce a novel approach combining a spectral deferred correction method for advection-diffusion-reaction and a jacobian-free Newton-Krylov method for the electron-electrostatic potential and evaluate its effectiveness on a set of canonical cases.

Background: Linear algebra and some experience with PDEs.

About the speaker: Lucas Esclapez is a project scientist in the Centre for Computational Science and Engineering (CCSE) at LBNL. He received his PhD from Institut National Polytechnique de Toulouse in 2015 and held postdocs at Stanford and CERFACS (France). His research interests are in numerical tools for computational fluid dynamics.

Colloquium broadcast via Zoom, 3pm Pacific/6pm Eastern
Email tim.hsu@sjsu.edu for an invitation

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