Dr. Ronald M. Caplan

Computational Scientist, Predictive Science Inc., San Diego, CA

Education

- University of California, Santa Barbara: B.A., 2003, Computer Science
  (Minor in Astronomy & Planetary Science)
- San Diego State University: M.S., 2008, Computational Science
- Claremont Graduate University: Ph.D., 2012, Computational Science
  (Concentration in Dynamical Systems and Chaos)

Summary and Experience

Dr. Ron Caplan is a computational scientist at Predictive Science Inc. (PSI) with over fifteen years of experience in applying computational methods in applied mathematics and physics. His main research interests are in developing and optimizing numerical methods for simulating physics-based models and their implementations in parallel high-performance-computing environments including GPU accelerators. His research currently focuses on the continued operation, development, and optimization of PSI's thermodynamic magnetohydrodynamic code (MAS) used to study the solar corona and heliosphere, as well as providing computational solutions for additional projects including solar image processing and modeling solar energetic particles.

Selected Publications

- *Advancing parabolic operators in thermodynamic MHD models II: Evaluating a Practical Time Step Limit for Unconditionally Stable Methods.* R. M. Caplan, C. D. Johnston, L. K. S. Daldoff, and J. A. Linker. Journal of Physics: Conference Series. ASTRONUM 2023. 2742 (2024) 012020
- *Improving Coronal Hole Detections and Open Flux Estimates.* R. M. Caplan, E. I. Mason, C. Downs, and J. A. Linker. The Astrophysical Journal. 958,43 (2023)
- *Can Fortran's 'do concurrent' Replace Directives for Accelerated Computing?* M. M. Stulajter, R. M. Caplan, and J. A. Linker. Accelerator Programming Using Directives. WACCPD 2021. Lecture Notes in Computer Science, 13194, 3-21 (2022). Springer, Cham.
- *Coronal Hole Detection and Open Magnetic Flux.* J. A. Linker, S. G. Heinemann, M. Temmer, M. J. Owens, R. M. Caplan, C. N. Arge, E. Asvestari, V. Delouille, C. Downs, and S. J. Hofmeister. The Astrophysical Journal. 918,1 (2021) 21
- *Variations in Finite Difference Potential Fields.* R. M. Caplan, C. Downs, J. A. Linker, and Z. Mikic. The Astrophysical Journal. 915,1 (2021) 44
- *GPU Acceleration of an Established Solar MHD Code using OpenACC.* R. M. Caplan, J. A. Linker, Z. Mikic, C. Downs, T. Torok, and V. S. Titov. Journal of Physics: Conference Series. ASTRONUM 2018. 1225,1 (2019) 012012
- *Predicting the Corona for the 21 August 2017 Total Solar Eclipse.* Z. Mikic, C. Downs, J. A. Linker, R. M. Caplan, D. H. Mackay, L. A. Upton, P. Riley, R. Lionello, T. Torok, V. S. Titov, J. Wijaya, M. Druckmuller, J. M. Pasachoff, and W. Carlos. Nature Astronomy. 2 (2018) 913-921
- *Synchronic coronal hole mapping using multi-instrument EUV images: Data preparation and detection method.* R. M. Caplan, C. Downs, and J. A. Linker. The Astrophysical Journal. 823,1 (2016) 53