Dr. G. ALLEN GARY
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QUALIFICATIONS

Dr. G. Allen Gary received his Ph.D. in elementary particle physics in 1969 from the University of Georgia. For 25 years, he was a member of the Solar Physics Group at the Marshall Space Flight Center (MSFC)/NASA, investigating the nature of coronal structures and solar magnetic fields. For the last 10 years, Dr. Gary has been a Principle Research Scientist with the Space Plasma and Aeronomic Research Center (CSPAR) at The University of Alabama in Huntsville (UAH). He is a member of International Astronomical Union (IAU). He has published over 110 papers on the solar magnetic field's configuration, evolution, and morphology together with estimation of the energy content of active regions. His theoretical work involves developing models of linear and nonlinear force-free magnetic fields and electric currents in the solar chromosphere-corona. He has extensive experience in developing new technology and techniques for space-based, sub-orbital, and ground-based magnetographs which are the core instruments for studying the processes that give rise to solar activity in the solar atmosphere. He was a member of the National Solar Observatory's (NSO) Advance Technology Solar Telescope (DKIST) Science Working Group, National Solar Observatory from 2001 to 2010. He is current mentoring a Ph. D. graduate student in the Electrical and Computer Engineering Department working on convolutional neural network problems in the area of solar physics.

PROFESSIONAL PREPAREDNESS/APPOINTMENTS

GEORGIA INSTITUE OF TECHNOLOGY Atlanta, Georgi**a**
B.S. *in Physics* August 1963 (Sigma Pi Sigma)
GEORGIA INSITITUE OF TECHNOLOGY Atlanta, Geor**gia**
M.S. *in Physics* August 1964
ASSISTANT AEROSPACE ENGINEER Huntsville, Alabama
Northrop Space Laboratories August 1964 – July 1965
UNIVERSITY OF GEORGIA Athens, Georgia
Ph. D. *in Physics* March 1969
RESEARCH SCIENTIST Huntsville, Alabama
Marshall Space Flight Center, Solar Physics, NASA March 1969 – March 2007
PRINCIPLE RESEARCH SCIENTIST Huntsville, Alabama
The University of Alabama in Huntsville, Center for Space Plasma and Aeronomic Research, March 2007- present

SELECTED RELEVANT PRODUCTS (PUBLICATIONS)

- Forecasting Solar Cycle 25 Using Deep Neural Networks, Benson, B., Pan, W. D., Prasad, A., Gary, G. A., & Hu, Q., Solar Physics, 295, 65, (2020)
- Comparison of Two Coronal Magnetic Field Models to Reconstruct a Sigmoidal Solar Active Region with Coronal Loops, Duan, A., Jiang, C., Hu, Q., Zhang, H., Gary, G. A., Wu, S. T., & Cao, J., Astrophysical Journal, 842, 119, (2017)

- On loading velocity oscillations during dynamic tensile testing with flying wheel systems, Erice, B., Roth, C., Gary, G., & Mohr, D., European Physical Journal Web of Conferences, 94, 01079, (2015)
- Determining the 3D Structure of the Corona Using Vertical Height Constraints on Observed Active Region Loops, Gary, G. A., Hu, Q., Lee, J. K., & Aschwanden, M. J., Solar Physics, 289, 3703, (2014)
- Erratum: Erratum to: A Rapid, Manual Method to Map Coronal-Loop Structures of an Active Region Using Cubic Bézier Curves and Its Applications to Misalignment Angle Analysis, Gary, G. A., Hu, Q., & Lee, J. K., Solar Physics, 289, 867, (2014)
- A Rapid, Manual Method to Map Coronal-Loop Structures of an Active Region Using Cubic Bézier Curves and Its Applications to Misalignment Angle Analysis, Gary, G. A., Hu, Q., & Lee, J. K., Solar Physics, 289, 847, (2014)
- A Small-scale Eruption Leading to a Blowout Macrospicule Jet in an On-disk Coronal Hole, Adams, M., Sterling, A. C., Moore, R. L., & Gary, G. A., Astrophysical Journal, 783, 11, (2014)
- Coronal Loop Mapping to Infer the Best Magnetic Field Models for Active Region Prominences, Gary, G. A., Hu, Q., & Lee, J. K., Nature of Prominences and their Role in Space Weather, 300, 416, (2014)
- A Small-Scale Filament Eruption Leading to a Blowout Macrospicule Jet in an On-Disk Coronal Hole, Sterling, A. C., Adams, M., Moore, R. L., Tennant, A. F., & Gary, G. A., AAS/Solar Physics Division Abstracts #44, 100.17, (2013)
- Beckers Effect in a Fabry-Pérot Imaging Interferometer and Its Effects on Magnetic Field Measurements, Robinson, B., Balasubramaniam, K., & Gary, G., American Astronomical Society Meeting Abstracts #220, 220, 206.23, (2012)

OTHER PRODUCTS

- Gary, G. A., Balasubramaniam, K. S., and Sigwarth, M.: 2003,' Multiple Etalon Systems for the Advanced Technology Solar Telescope', SPIE proceeding: 'Innovative Telescopes and Instruments for Solar Physics', eds. Stephen L. Keil and Serge V. Avakyan, SPIE 4853-37, p.252-272.
- Rimmele, T., Hubbard, R., Balasubramaniam, K. S., Berger, T., Elmore, D., Gary, G. A., Jenings, D. Keller, C., Kuhn, J., Lin, H., Mickey, D., Moretto, G., Socas-Navrro, J., Stenflo, J, &, Wang, H., 2004, "Instrumentation for the Advanced Technology Solar Telescope, 2004, SPIE, Glasgow, Scotland
- Robinson, Brain M., Balasubramaniam, K. S., Gary, G. A., 2006, Advanced technology solar telescope Fabry-Perot interferometer telecentric optical design, Optical Engineering, 45, 23001
- Robinson, B., Balasubramaniam, K. S., and Gary, G. A., 2006, ATST Multiple Fabry-Perot Interferometer Telecentric Optical Design, Optical Eng., 45, 23001

SELECTED BOOKS

- Gary, G. A. (Editor), *Comet Kohoutek* (1993f) (Workshop Proceedings held at Marshall Space Flight Center, June 13-14, 1974), NASA SP-355.
- Clifton, K. S. and G. A. Gary (Editors*), Proceedings of the Shuttle-Based Cometary Science Workshop*, Special NASA/MSFC publication (November 1976).

SYNERGISTIC ACTIVITIES

- UAH graduate student advisors/mentors/committee member
- LASER Volunteer (NASA/MSFC science outreach program)
- K-12 Science Fair Judging
- VBAS lecturer (Amateur astronomy club)
- Public School lecturer
- NASA Space Physics Educational Outreach PI

COLLABORATORS & OTHER AFFILIATION

His national collaborations have included the National Solar Observatories at Kitt Peak and Sacramento Peak, and his international collaborations have included Observatoire de Paris/Meudon, Laboratorie d'Astronomie Spatiale/Marseille, Osservatorio Astrofisico di Arcetri/Florence, Instituto de Astronomia y Fisica del Espacio/Buenos Aires, Technical University/Berlin, Georg August Universitat/Goettingen, Kiepenheuer-Institut fur Sonnenphysik, and Indian Institute of Astrophysics/Bangalore.