

BARBARA G. GRANT, M. S.
Grant Drone Solutions, LLC
P. O. Box 1373
Cupertino, CA 95015-1373
(520) 488-1534 (mobile)
(408) 873-7314 (msg)
<http://www.grantdrone.com>
email: barbara@grantdrone.com

SUMMARY

Barbara G. Grant, M. S. is author of *Getting Started with UAV Imaging Systems: A Radiometric Guide* published in 2016 by SPIE Press. She also authored *Field Guide to Radiometry* (2011) and co-authored *The Art of Radiometry* (2009). Grant has taught classes to professional technologists since 2009.

A consultant in electro-optics since 1995, Grant is currently a Subject Matter Expert (SME) on spacecraft instrumentation for Cornell Technical Services (CTS), a Distinguished Instructor in the University of California-Irvine Certificate Program in Optical Engineering and Optical Instrument Design, and a SME in Radiometry and Applications for Georgia Tech Professional Education—Defense Technology Training.

CAPABILITIES

Engineering/Analysis

- **Spacecraft Instrumentation Subject Matter Expert**
- **Radiometry and Applications Subject Matter Expert**
- **Analysis of risk for spacecraft electro-optical instrumentation**
- **Conceptual system design and development of test plans**
- **Applying the concepts of radiometry and photometry to a diverse spectrum of problems**
- **Radiometric calibration test planning, implementation, and data analysis**
- **Trade studies for E-O and IR systems on airborne and spaceborne platforms**

Teaching

- **UC Irvine Division of Continuing Education—Distinguished Instructor Award, December, 2016**

“Introduction to Radiometry: the Propagation and Measurement of Optical Radiant Energy” taught online in Spring Quarter of each year since 2014

- **Georgia Tech Professional Education**

“Radiometry and Applications” first taught in 2012 a 2 ½ day short course conducted either at GT or onsite at client’s location

- **SPIE—The International Society for Optics and Photonics**

Teaching short courses since 2009, including on-site teachings for SPIE clients.

SC 1073 “Radiometry and its UAV Applications”

SC 1123 “The Building Blocks of IR Instrument Design

SC 1143 “Component-Level Calibration: Sources, Detectors, and Measurement Hardware”

EMPLOYMENT HISTORY

- **Self-employed consultant 1995-present**

Grant Drone Solutions, LLC 2016 - present
Lines and Lights Technology, 1995 – 2016.

- **Projects have included**

- **FLIR image analysis**
- **Product development with miniature fiber-optic USB spectrometer**
- **Visible imaging detector selection and analysis**
- **Uncooled thermal imager studies (microbolometer, pyroelectric, etc.)**
- **Test and characterization of UV lamps used in indoor tanning industry, and analysis of data to separate source (lamp) and platform (testbed) issues**
- **Production of two volumes of market research on spectroscopic instruments integrated into factory process lines**
- **Disparity Studies**

- **NASA Contractor, 1992 - 1994, Two NASA Group Achievement Awards for the GOES Weather Satellite Program, 1994 and 1995**

Swales and Associates, Greenbelt MD and Palo Alto, CA 1992 – 1994
Spacecraft Instrumentation Engineer

On-site NASA representative at Space Systems/Loral in Palo Alto, CA, overseeing integration and test phase of GOES-8 and -9 imager and sounder. Analyzed test data and performed special tests at the spacecraft

level in both thermal vac and ambient conditions, and in specialized test environments such as solar simulator.

Research and Data Systems Corp., Greenbelt, MD 1992

Senior Optical Scientist

Analyzed calibration issues for MODIS sensor on EOS/Terra platform; developed calibration handbook.

- **Lockheed-Martin Missiles and Space Co, Sunnyvale, CA 1989 – 1992**

Senior Research Engineer

Analyzed system requirements and hardware configuration for EO instrument package and performed post flight data analysis. Compared cryogenic infrared calibration facilities and procedures for exoatmospheric applications. Performed trade studies on interferometer system design.

- **Optical Sciences Center, Remote Sensing Group, University of Arizona, Tucson, AZ 1987 - 1989**

Graduate Research Assistant

Performed research on the absolute radiometric calibration of spaceborne sensors such as Landsat Thematic Mapper and NOAA AVHRR. Fieldwork at White Sands, N. M. and other locations to gather solar and ground reflectance data for use in atmospheric radiative transfer models. Use of radiative transfer codes and orbital mechanics programs.

- **Litton Applied Technology, San Jose, CA 1986 – 1987**

Senior Engineer.

Research and development on spread spectrum communications

- **TRW, Sunnyvale, CA 1983 - 1986**

Engineer. Performed analytical studies in orbital mechanics, radiative transfer, and communications signal processing.

EDUCATION

- **M. S. Optical Sciences, The University of Arizona, 1989**
- **MSEE coursework, Santa Clara University, 1985 - 1987**
- **B. A. Mathematics, San Jose State University, 1983**

PUBLICATIONS

Books

Grant, B. G., *Getting Started with UAV Imaging Systems: A Radiometric Guide*, SPIE Press, Bellingham, WA, July 20, 2016.

Grant, B. G., *Field Guide to Radiometry*, SPIE Press, Bellingham, WA (November 2011).

J. M. Palmer and B. G. Grant, *The Art of Radiometry*, SPIE Press, Bellingham, WA (2009).

Conference Papers

Grant, B. G., "UAV Imagery Analysis: Challenges and Opportunities," Proceedings of SPIE 10204, Long Range Imaging II, 1020406 (May 1, 2017); doi:10.1117/12.2264138

Grant, B. G., "Imagery analysis and the need for standards", Proceedings of SPIE Vol. 9195, 91950B (2014) [SPIE Digital Library](#)

Grant, B. G., and D. T. Hardy, "Muzzle flash issues related to the Waco FLIR analysis," *Targets and Backgrounds VII: Characterization and Representation*, Proc. SPIE 4370, pp. 314-324, 2001.

Che, N. B., B. G. Grant, D. E. Flittner, P. N. Slater, S. F. Biggar, R. D. Jackson, and M. S. Moran, "Results of calibrations of the NOAA-11 AVHRR made by reference to calibrated SPOT imagery at White Sands, N. M.," *Calibration of Passive Remote Observing Optical and Microwave Instrumentation*, Proc. SPIE 1493, pp 182-194, 1991.

B.L. Markham, J.R. Irons, D.W. Deering, R.N. Halthore, R.R. Irish, R.D. Jackson, M.S. Moran, S.F. Biggar, D.I. Gellman, B.G. Grant, J.M. Palmer and P.N. Slater, "Radiometric calibration of aircraft and satellite sensors at White Sands, NM," Proc. IGARSS'90, 515, Washington DC, 1990.

Grant, B. G. "Calibration of the Advanced Very High Resolution Radiometer," M. S. Thesis, The University of Arizona, 1989.

SPIE Newsroom

Barbara Grant, "Getting Started with UAV Imaging Systems: A Radiometric Guide," 6 April 2017, SPIE Newsroom. DOI: 10.1117/2.2201704.01

Barbara Grant, "Imagery Analysis: Standards Needed for the Drone Age," Defense and Security, 21 August 2014, SPIE Newsroom. DOI: 10.1117/2.1201408.005594

Other

"How the Military UAV Community Can Learn from the Commercial Drone World (and Vice-Versa" *DSIAC Journal*, pp. 4-9, Spring, 2018.

["How Can UAV Data Solve Imaging Problems?"](#) **Commercial UAV News**, 12/11/2017,