

Blake G. Crowther, Ph.D.

Professional Experience

- 2014-Present Principal Engineer, Synopsys, Inc., Optical Solutions Group
2012-Present Associate Research Professor, Utah State University, Electrical and Computer Engineering
2005-2014 Senior Optical Scientist, Space Dynamics Laboratory
2005-2012 Adjunct Assistant Professor, Utah State University, Electrical and Computer Engineering
2002-2005 Engineer IV, Space Dynamics Laboratory
2000-2002 Senior Systems Engineer, Optical Research Associates
1998-2000 Senior Engineer, Space Dynamics Laboratory
1998-2001 Adjunct Assistant Professor, Utah State University, Electrical and Computer Engineering
1997-1998 Member Technical Staff II, Hughes Missile Systems Company
1997-Present Adjunct Assistant Research Scientist, University of Arizona, College of Optical Sciences
1992-1997 Research Associate, University of Arizona, College of Optical Sciences

Education

- 1997 Ph.D. Degree in Optical Sciences, University of Arizona, College of Optical Sciences
1994 M.S. Degree in Optical Sciences, University of Arizona, College of Optical Sciences
1992 M.S. Degree in Agricultural and Irrigation Engineering, Utah State University
1990 B.S. Degree in Electrical Engineering, Utah State University
1990 B.A. Degree in Physics, Utah State University

Dr. Crowther has designed, tested, and led teams to build several types of optical and electro-optical instruments. These include CCD- and CMOS-based cameras for space missions lasting from one to more than ten years of operation. He has designed and led the optical design, system build, and test of several infrared instruments. Some major missions that have flown, are currently flying, or will fly optical designs or instruments on which Dr. Crowther has worked include TES (AURA for NASA), SABER (TIMED for NASA), SOFIE (AIM for NASA), WISE (WISE for NASA), OCAMS (OSIRIS-REx for NASA), and MIGHTI and FUV (ICON for NASA). These instruments range from the ultra-violet, to the visible, to the far infrared portions of the electromagnetic spectrum. He has also performed research for future optical instruments to include ultra-stable laser-based calibration sources, fiber-based interferometric sensors to detect gravitational waves, and deployable optics. Ground-based optical designs and instrument designs on which Dr. Crowther have worked include cryogenic infrared radiometers and Michelson interferometers. He has also designed and worked on lidar systems including tunable DIAL (1.5 – 1.7 μm) and three color Nd:YAG (355, 532, and 1064 nm) systems.

Dr. Crowther has experience designing unique all-reflective off-axis systems and refractive systems such as super-achromats for spectrometry applications. He has designed novel hyperspectral and polarimetric imaging systems. He has designed multiple low-cost optical systems for cameras, fluorescence imagers, and bar-code readers some of which use plastic injection molded elements that have been produced in quantities greater than 100,000. He has designed optical systems for assessing human dermatological health, as well as flexible and rigid endoscopes.

His professional experience also includes designs for extreme ultra-violet lithography fly's eye illuminators. He has designed and performed analysis on shearing interferometers and grating-based monochromator systems for the lithography industry as well.

In addition, Dr. Crowther has taught graduate-level optics courses. He has also mentored several students in obtaining Ph.D. and M.S. degrees in optical sciences, electrical and computer engineering, and physics.

Patents

- US 8,542,450 Hopkins, Gregory; Crowther, Blake; Johnson, Kendall; and Griffiths, Vaughn, (13/023/305), "Kinematic optic mount," Sep. 24, 2013.
- US 7,394,543 Crowther, Blake G., "Spectral selection and conveyance using micro filters and optical fibers," Jul. 1, 2008.
- US 7,014,113 Powell, George; Crowther, Blake; Hyde, Ryan; Wenzel, Mark; Hepworth, Paul; and Taylor, Morgan, , "Versatile graphical code reader for reading different types of graphical codes," Mar. 21, 2006.
- US 6,736,320 Crowther, Blake; Hyde, Ryan; Lewis, Collin; and Powell, George, "Image based graphical code reader device with multi-functional optical element and converging laser targeting," May 18, 2004
- US 6,552,318 Crowther, Blake G.; McKenney, Dean B.; Sparrold, Scott W.; Whalen, Michael R.; and Mills, James B., , "Sensor system with rigid-body error correcting element," Apr. 22, 2003.
- US 6,201,230 Crowther, Blake G.; McKenney, Dean, B.; Sparrold, Scott W.; Mills, James B.; Beard, Douglas M.; and Harrison, Daniel C., "Sensor system with dynamic optical corrector," Mar. 13, 2001.
- US 6,180,938 Crowther, Blake G.; McKenney, Dean B.; Sparrold, Scott W.; and Mills, James B., "Optical system with a window having a conicoidal inner surface, and testing of the optical system," Jan. 30, 2001.

Applications

- US App 13767112 Crowther, Blake and Peterson, James, "Systems and methods for conveying energy," Feb. 28, 2012 (Pub No. 20130221206).
- US App 13323456 Crowther, Blake and Peterson, James, "Transferring optical energy," Jun. 14, 2012 (Pub No. 20120147362).
- US App 13885140 Crowther, Blake; Newswander, Trent; Champagne, James; and Norris, Adam, "Multiple petal deployable telescope," Feb. 25, 2011 (Pub No. 20130229709).

Publications

T. Newswander, B. Crowther, G. Gubbels, and R. Senden, "Aluminum alloy 6061 and RSA-6061 heat treatment for large-mirror applications," Proc. SPIE 8837, 2013.

J. Hancock, B. Crowther, M. Whiteley, R. Burt, M. Watson, J. Nelson, C. Fellows, B. Rizk, E. Kinney-

- Spano, M. Perry, and M. Hunten, "OSIRIS-Rex OCAMS detector assembly characterization," Proc. SPIE 8860, 2013.
- J. Champagne, B. Crowther, and T. Newswander, "Deployable mirror for enhanced imagery suitable for small satellite applications," Small Satellite Conference, Advanced Technologies II, 2013.
- J. Champagne, J. Burge, and B. Crowther, "Thermo-opto-mechanical analysis of a cubesat lens mount," Proc. SPIE 8125, 2011.
- B. Crowther, J. Peterson, L. Gordley, M. Hervig, J. Burton, C. Fish, G. Diskin, and G. Sachse, "Digital array gas correlation radiometry (DAGR): A new approach to passively sensing the planetary boundary layer," Poster, AGU, Fall 2010.
- T. Newswander and B. Crowther, "Optical system materials selection using performance indices in a simultaneous optimization approach," Proc. SPIE 7425, 2009.
- T. Wilkerson, G. Bingham, V. Zavyalov, J. Swasey, J. Hancock, B. Crowther, S. Cornelsen, C. Marchant, J. Cutts, D. Huish, C. Earl, J. Andersen, and M. Cox, "AGLITE: a multi-wavelength lidar for measuring emitted aerosol concentrations and fluxes and air motion from agricultural facilities," Proc. SPIE 6409, 2006.
- T. Wilkerson, V. Zavyalov, G. Bingham, J. Swasey, J. Hancock, B. Crowther, S. Cornelsen, C. Marchant, J. Cutts, D. Huish, C. Earl, J. Andersen, and M. Cox, "AGLITE: a multi-wavelength lidar for aerosol size distributions, flux, and concentrations," Proc. SPIE 6214, 2006.
- M. Schwalm, M. Barry, G. Perron, D. Sampath, F. LaMalva, J. Guregian, and B. Crowther, "Cryogenic telescope, scanner, and imaging optics for the wide-field infrared survey explorer," Proc. SPIE 5904, p. 178-184, 2005.
- B. G. Crowther and S. R. Wassom, "Toward end-to-end optical system modeling and optimization: A step forward in optical design," Proc. SPIE 5524, 2004.
- B. G. Crowther, V. Zakharenkov, G. Jensen, V. Sinelschikov, T. Humphries, V. Misnik, R. Anderson, and J. Atkinson, "Sensor design and capabilities for the Russian American Observational Satellites (RAMOS)," Proc. SPIE 5234, pp. 96-105, 2003.
- B. G. Crowther, D. G. Koch, J. M. Kunick, J. P. McGuire, R. Harned, and R. A. Gontin, "A fly's eye condenser system for uniform illumination," Proc. International Optical Design Conf (SPIE vol 4832), pp. 302-310, 2002.
- B. G. Crowther, D. K. Scott, A. L. Shumway, R. D. Williams, and V. A. Thurgood, "Cryogenic infrared radiometer for transferal of NIST radiometric standards," Proc. SPIE 4450, pp 168-179, 2001.
- B. G. Crowther, J. Elwell, and R. E. Anderson, "Cryogenic optical design and testing of the focal plane optomechanical assembly of the Tropospheric Emission Spectrometer," Proc. SPIE 4093, pp. 423-434, 1999.
- B. G. Crowther, D. F. McKinney, and J. P. Mills, "Aberrations of optical domes," Proc. International Optical Design Conf (SPIE Vol. 3482), pp. 48-61, 1998.
- J. Smith, K. J. Thome, B. G. Crowther, and S. F. Biggar, "Field evaluation of a diffuse-to-global irradiance meter for vicarious calibration," Proc. IGARSS, 1998.

M. Sicard, K. J. Thome, B. G. Crowther, and M. W. Smith, "A shortwave infrared spectroradiometer for atmospheric transmittance measurements," *J. Atmos. and Oceanic Tech.*, 15:174-183, 1998.

K. J. Thome, B. G. Crowther, And S. F. Biggar, "Reflectance- and Irradiance-based calibration of Landsat-5 Thematic Mapper," *Canadian J. of Remote Sens.*, 23(4):309-317 1997.

B. G. Crowther, K. J. Thome, S. F. Biggar, and C. J. Burkhart, "Internally-baffled integrating sphere cosine collector," *Proc. SPIE* 3117, 1997.

B. G. Crowther, "The design, construction, and calibration of a spectral diffuse/global irradiance meter," Ph.D. Dissertation, University of Arizona, Tucson, Arizona, 1997.

B. G. Crowther, "Computer modeling of integrating spheres," *Applied Optics* 35(30):5880-5886, 1996.

C. M. U. Neale and B. G. Crowther, "An airborne multispectral video/radiometer system: development and calibration," *Remote Sens. of Env.*, 49:187-194, 1994.

B. G. Crowther, "Radiometric calibration of multispectral video imagery," M.S. Thesis, Utah State University, Logan, Utah, 1992.

C. M. U. Neale, R. D. Ramsey, B. Crowther, J. Payero, and M. Follegati, "Multi-scale classification of watershed land cover using nested satellite and airborne video imagery," *Proc. 27th Annual Conf. Am. Water Res. Assoc.*, 1991.

Awards

2013 Space Dynamics Laboratory Performance Award

2011 Space Dynamics Laboratory Performance Award

2007 Space Dynamics Laboratory Performance Award

1999 OSA Allen Prize

1995-1997 NASA Graduate Student Researchers Program Fellow

1991-1992 Rocky Mountain NASA Space Grant Consortium Fellow

Professional Activities/Societies

OSA – Member

SPIE – Life Member

2003 Allen Prize Award Committee Chair

2002 Allen Prize Award Committee

Phi Kappa Phi, National Honor Society – Member

Tau Beta Pi, National Engineering Society - Member