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**James B. Heaney  
E. Todd Kvamme**  
*Editors*

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# Introduction

This volume is the Proceedings from our 15th biennial series of conferences on Cryogenic Optical Systems and Instruments. This year's conference was held in San Diego on 29 August 2013, as a part of SPIE Optics + Photonics symposium. Previous books in this series include: SPIE volumes 509 (1984), 619 (1986), 973 (1988), 1340 (1990), 1765 (1992), 2227 (1994), 2814 (1996), 3435 (1998), 4131 (2000)<sup>1</sup>, 4822 (2002), 5172 (2003), 5904 (2005), 6692 (2007), 7439 (2009)<sup>2</sup>, and 8150 (2011). Taken together, these yellow-covered Proceedings are a veritable library documenting more than a quarter century of technological advances related to the design, development, testing, and performance of optical components and instruments and the mechanisms and techniques used to cool and maintain them at cryogenic temperatures. The international community is well represented in their contents.

From the beginning, the needs of the aerospace community have had a formative influence on the evolution of this technology. Space satellite missions such as UARS, COBE, SIRTf (Spitzer), Cassini, WMAP, the evolving JWST, and many others have contained instrumentation that was required to operate in some cases at temperatures near absolute zero. Their design, testing and performance evaluation challenged their cryogenic engineering and forced an advancement of the state-of-the-art. In our most recent conferences dating back to 2005, NASA's JWST mission, with its joint NASA/ESA instrumentation suite, has contributed significantly to the contents of SPIE Vols. 5904, 6692, 7439\*, 8150, and this current volume. A statement of the challenges confronted and the clever engineering remedies applied can be found in the papers contained in their Proceedings. In our age when digital publishing and record archiving have forced institutions of all types to re-evaluate their methods of capturing institutional knowledge, we are privileged with these Proceedings to be part of the SPIE's Digital Library that can make the fruit of our labor permanently and readily available to all.

For the first time in this series of conferences, the editors have established a website – [www.cryooptics.com](http://www.cryooptics.com) – that is intended to be a gathering place for community ideas and a bulletin board for cryo-data, web links, and informal reports and related documents that will appear in the two years between our formal SPIE sponsored conferences. The website is currently live, but it is still under development. It is ultimately intended to act as an every-day hub for this conference.

**E. Todd Kvamme**  
**James B. Heaney**

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<sup>1</sup> Joint with Infrared Spaceborne Remote Sensing VIII

<sup>2</sup> Joint with Astronomical and Space Optical Systems