

OPN

Optics &
Photonics
News

Laser
Welding

Spontaneous
Parametric
Processes

The Life and
Work of Ludwig
Boltzmann

Optical Innovations in the
**James Webb
Space Telescope**

JWST's primary mirror consists of 18 separate mirror segments, which will unfold themselves shortly after launch.

COVER: A NASA engineer looks on as the first six flight-ready JWST primary mirror segments are prepped to begin final cryogenic testing.

Photo by NASA/MSFC/David Higginbotham.

This page: JWST's Engineering Design Unit primary mirror segment.
Photo by Drew Noel.

[COVER STORY]

22 Optical Innovations in the James Webb Space Telescope

The team building the next big space observatory is using a surprising number of optical innovations—including the technique that helped fix the Hubble Space Telescope.

Patricia Daukantas

30 Keeping It Together with Laser Welding

Laser welding is faster and cheaper than conventional joining technology, and it may even lead to lower greenhouse-gas emissions. Although laser welding is by no means easy to do, technological advances are making it an increasingly viable option within various industries, including transportation, electronics and sensing.

Breck Hitz

36 Spontaneous Parametric Processes in Modern Optics

Spontaneous parametric processes have proved to be integral to the advancement of quantum information science. Their incredible versatility, in terms of the emission properties of entangled photons, allows for nearly unimaginable applications in the transmission and processing of quantum information.

Hector Cruz-Ramirez, Roberto Ramirez-Alarcon, Maria Corona, Karina Garay-Palmett and Alfred B. U'Ren

42 Ludwig Boltzmann: A Pioneer in Atomic Theory

Ludwig Boltzmann's pioneering work in atomic-molecular kinetics, statistical mechanics and thermodynamics bridged the gap between Maxwell's classical physics of the 19th century and the quantum era ushered in by Planck and Einstein.

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Imaging living organisms with sheets of light; "cakes" of carbon nanotubes could measure terahertz power; making materials with no phase delay; tiny camera captures images without lenses.

Patricia Daukantas and Yvonne Carts-Powell

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Fabricating aspherical lenses.

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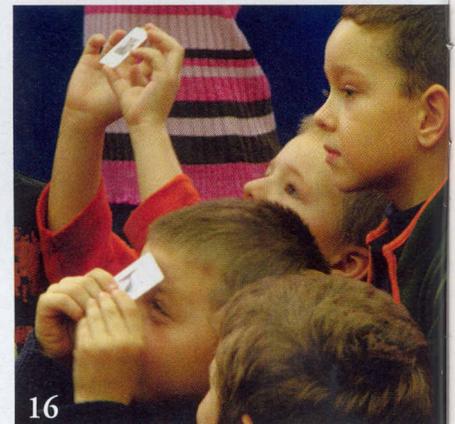
Danuta Bukowska and Ewa Kwiatkowska

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Results from OPN's sixth annual After Image photo contest.

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Remembering Anthony Siegman, a laser pioneer and OSA Fellow Emeritus.



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Courtesy of Danuta Bukowska



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