

# New views of the Sun with EUVI and the future of multilayers for solar physics

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From EIT/SOHO to TRACE to EUVI/STEREO, normal incidence multilayer optics have proved very successful in providing us with revolutionary images of our Sun. Since the launch of the STEREO mission on October 26, 2007, the EUVI telescopes have been performing nominally. The multilayers of EUVI were produced by the Institut d'Optique and the Institut d'Astrophysique Spatiale<sup>1</sup>. With two telescopes observing our star from two different viewpoints, we are now able to reconstruct the three-dimensional structure of solar features, such as prominences or magnetic fields loops. We present a selection of preliminary scientific results from EUVI.

A host of new challenges are coming with the new solar missions. Some of the outstanding problems in solar physics require higher sensitivities, observations at longer wavelengths than those attainable today, or the separation of neighbouring spectral lines. Furthermore, a mission like Solar Orbiter, an ESA probe that will approach the Sun at 0.2 UA, puts severe constraints on the robustness of the coatings. New materials/combinations of materials are already helping in improving the sensitivity<sup>3</sup>. The dual-band multilayer concept<sup>2</sup> is also promising to help reduce the heat load on the instruments. The dual-band coating technology also provides a way of imaging new wavebands by rejecting very efficiently selected spectral lines that would otherwise contaminate the spectral response.

<sup>1</sup> M.-F. Ravet et al., "Recent results in solar imaging using ion beam sputtered multilayers", this conference

<sup>2</sup> C. Hecquet et al., "Two channel EUV mirror for solar missions: design, performances and stability", this conference

<sup>3</sup> F. Auchère et al., "HECOR, a HELium CORonagraph aboard the Herschel sounding rocket" Solar Physics and Space Weather Instrumentation II, San Diego, 26-30 Aug 2007, Proc SPIE 6689, (2007)