UNIVERSITÉ DE GENÈVE
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SÉMINAIRE DE PHYSIQUE CORPUSCULAIRE

SUJET: **Astronomical Imaging a Thousand Times Sharper than Hubble: Optical Interferometry with the Cherenkov Telescope Array**

PAR: **Prof. Dainis Dravins**
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RÉSUMÉ:

Much of the progress in astronomy is led by improved imaging. In the optical, one tantalizing threshold will be two-dimensional imaging of stellar surfaces. With typical sizes of a few milliarcseconds, bright stars require interferometry over kilometer-long baselines. Although several concepts for such interferometer complexes on the ground and in space have been proposed, their realization is not imminent.

However, the availability of large optical flux collectors (air Cherenkov telescopes, in particular CTA – the Cherenkov Telescope Array – primarily erected for gamma-ray studies) enable a revival of the quantum-optical method of intensity interferometry, once developed for astronomy but recently mainly pursued as boson- or HBT-interferometry in high-energy particle physics.

The advantage of intensity interferometry is that it is insensitive to either atmospheric turbulence or to telescope optical imperfections, enabling very long baselines as well as observing at short optical wavelengths. Telescopes are connected only electronically (rather than optically), and the noise budget relates to electronic timescales of perhaps 10 nanoseconds (light-travel distances of meters), enabling the use of also optically imperfect telescopes.

CTA will cover an area of a few km^2, and with suitable software could already quite soon become the first kilometer-scale optical imager, reaching into novel microarcsecond parameter domains. It could reveal the surfaces of rotationally flattened stars with their circumstellar disks and winds, monitor a nova eruption, or possibly even visualize an exoplanet during its transit across some nearby star.

INFORMATION : http://dpnc.unige.ch/seminaire/annonce.html
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