High-angular and high-contrast VLTI observations from Y to L band with the Asgard instrumental suite

The VLTI is one of the most proficient observatories in the world for high angular resolution. It has hosted several interferometric instruments operating in various bandwidths in the infrared. As a result, the VLTI has yielded countless discoveries and technological breakthroughs. We suggest to ESO a new concept for a visitor instrument for the VLTI: Asgard. Asgard promises significant advances in diverse astrophysical fields such as the formation of the binaries and multiple systems, the formation and evolution of exoplanets and the characterization of their atmospheres, the observation of mass accretion around YSOs and AGNs, the study of protoplanetary or exozodiacal disks. To do so, Asgard embeds four natively collaborating instruments: HEIMDALLR, an all-in-one instrument performing both fringe tracking and stellar interferometry with the same optics; Baldr, a Strehl optimizer; BIFROST, an integrated-optics combiner with high spectral resolution capabilities from Y to H band; and NOTT, a nulling interferometer dedicated to imaging young nearby planetary systems in the L' band. The overlap between the science cases across different spectral bands yields the idea of making the instruments complementary to deliver sensitivity and accuracy from the J to M bands.