High-contrast imaging polarimetry of exoplanets and circumstellar disks

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Propositions accompanying the thesis

High-contrast imaging polarimetry of exoplanets and circumstellar disks

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1. The high polarimetric accuracy required for quantitative polarimetry of circumstellar disks and exoplanets can be achieved by performing detailed calibrations of high-contrast imagers.

   (*Chapter 2 & 3*)

2. Measurements of the near-infrared linear polarization of self-luminous exoplanets and brown dwarf companions can reveal disks around these companions and uniquely constrain the orientation of these disks.

   (*Chapter 4 & 5*)

3. To quickly implement and test new observing techniques, it is vital to directly interact with the instrument and have easy access to the expertise of the staff of the observatory.

   (*Chapter 4 & 6*)

4. Mirror coatings of high-contrast imagers should not be optimized for maximum reflectivity, but should be designed to have a retardance close to 180º.

   (*Chapter 2, 3 & 7*)

5. An image derotator (K-mirror) is a source of both problems and opportunities to polarimetrists.

   (*All chapters*)

6. Images of the (fractional) Stokes parameters describing polarization should be shown on a diverging color map with different colors for positive and negative values and a shared, neutral color for zero.

7. The astronomical community should agree on the (underlying) sign conventions and reference frames for the mathematical description of polarization.

8. Openly available, well-documented, and easy-to-use software packages foster collaborations, improve productivity, and enhance the accuracy, transparency, and reproducibility of scientific results.

9. We should rethink space-based astronomy and planetary science in light of the coming revolution in spaceflight brought by large, rapidly reusable rockets.

10. The unit prefix μ for micro should be written in a roman (upright) font style and not in an italic (slanted) font style.