Optimal Optical Coronagraphs
25 – 29 september 2017 @ Snellius

High-contrast imaging instruments based on coronagraphic techniques have proven to be essential for observing the few giant exoplanets that have been imaged so far. Still, several challenges remain in the development of ground- and space-based instruments that will be sensitive to a substantially larger population of planets. The Optimal Optical Coronagraph (OOC) Workshop gathered researchers working on exoplanet instrumentation to stimulate the emergence and sharing of new ideas.

We consider our 5-day workshop to be a big success. The program effectively encouraged discussion and boosted mutual progress on outstanding issues identified by the group. Interactive talks and panel discussions allowed the attendees to share their knowledge and experience with coronagraph optimization, testing, and operations. Once the problems were identified, participants split into collaborative groups to tackle them. These splinter sessions, at the core of the workshop program, gave the participants the opportunity to combine efforts and make rapid progress on critical issues.

Experience with the format of the workshop:
- The discussions were useful and occasionally intense. All attendees contributed.
- The "crazy ideas" sessions and resulting splinter sessions really produced crazy, though useful, ideas.
- The 2.5 days of only loosely scheduled program time was used to its fullest with interactive (splinter) sessions. The progression of splinter session topics flowed naturally.
- All splinter groups made progress on novel concepts, computer codes, and documentation.

The main outcomes of the workshop :
- A plan to publish a series of three conference proceedings at
  'SPIE Astronomical Telescopes + Instrumentation' in Austin, TX in June 2018 summarizing progress made during the workshop:
  - Methods for coronagraph optimization and performance metrics (led by Garreth Ruane)
  - Review of WFS/C and CDI (led by Nemanja Jovanovic)
  - Technologies and pathways (led by Frans Snik)
- Large amount of documentation in a shared Google drive folder:
  https://drive.google.com/drive/folders/0ByGd8kr1gdDcS296T1I3RHJIT3M?usp=sharing
- New optimization algorithms for coronagraph systems with codes are being made freely available, with an emphasis on combining approaches developed by different researchers.
- We identified new pathways for future development: Photonic integrated systems, optical elements with combined functions to enable minimal systems design, photon sieves, one-dimensional space telescopes, etc.
- We identified new pathways for international collaboration, including a student exchange network and community support on experimental testbeds.

- We initiated the organization of a follow on workshop to be held in California in 2018.

Organizers
Elsa Huby (Paris Observatory, France)
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Garreth Ruane (Caltech, United States)
Frans Snik (Leiden University, the Netherlands)