

# Johan MAZOYER

**Interêts de recherche :** Instrumentation Optique, Imagerie Directe et Coronagraphie, Observation et Caractérisation de Systèmes Extrasolaires, Disques de Débris

## 1 EXPÉRIENCES PROFESSIONNELLES

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Chargé de recherche CNRS – <b>LESIA/Observatoire de Paris</b> (France)	Depuis 2020
Sagan Fellow – <b>Jet Propulsion Laboratory</b> (Pasadena, CA)	2018 - 2019
Post-doctorant – <b>Johns Hopkins University</b> (Baltimore, MD)	2016 - 2018
Post-doctorant – <b>Space Telescope Science Institute</b> (Baltimore, MD)	2014 - 2016
Doctorant – <b>LESIA/Observatoire de Paris</b> (France)	2011 - 2014

## 2 FORMATION

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<b>Doctorat – Université Paris Diderot</b> <i>Astronomie et Astrophysique</i>	Paris, France Septembre 2014
<b>Master 2 – Université Paul Sabatier</b> <i>Astrophysique, Science de l'Espace, Planétologie</i>	Toulouse, France Septembre 2011
<b>Diplôme d'ingénieur – ISAE Supaero</b> <i>Systèmes Spatiaux et Techniques d'Imageries Spatiales</i>	Toulouse, France Septembre 2011
<b>Diplôme d'ingénieur – Ecole polytechnique</b> <i>Systèmes Embarqués (électronique et informatique)</i>	Palaiseau, France Septembre 2011

## 3 BOURSES & PRIX

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Carl Sagan Fellowship ( <b>NASA Hubble Fellowship Program</b> ) – 3 ans	2018
Couverture du journal <b>Astronomy &amp; Astrophysics</b> ( <b>Volume 564</b> )	2014
Meilleure présentation, conférence des chercheurs du CNES (JC2)	2013
Bourse doctorale du CNES – 3 ans	2011
Bourse d'étude de l'Ecole polytechnique – 4 ans	2007

## 4 DIFFUSION DES SCIENCES

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### Podcast Science

J'anime chaque semaine **PodcastScience.fm**, émission scientifique hebdomadaire de radio (podcast) d'une heure et demie à 3h. Le podcast produit des émissions sur tous les domaines scientifiques et je réalise tous les contenus relatifs à la physique et à l'astrophysique.

### Conférences grand public

CERN (Genève) et Palais de la découverte (Paris)



## 5 ENSEIGNEMENT ET ENCADREMENTS

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### Co-encadrement de doctorants

- **Lucie Leboulleux** (thèse soutenue en Décembre 2018)
- **Kevin Fogarty** (thèse soutenue en Août 2017)

**Qualification aux fonctions de maître de conférences dans la section 34** 2015

**Université Paris Diderot – Paris 7** 2013 & 2014

- 32h de vacation (électronique pour L3 cursus ingénieur)

**Université Paris Descartes – Paris 5** 2011 & 2012

- 72h de vacation (hydrodynamique pour L1 cursus médecine)

**La Main à la pâte – Académie de Perpignan** 2007 – 2008

- Stage de première année de l'Ecole polytechnique (8 mois) où j'ai enseigné les sciences en primaire à temps plein. Les mercredis étaient consacrés à la formation des professeurs des écoles à l'enseignement des sciences.

## 6 PRISES DE RESPONSABILITÉS POUR LA COMMUNAUTÉ

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### Organisation de conférences et ateliers

- Science Organizing Comitee et organisateur de la conference **National Capital Area Disks** (Baltimore, MD, Oct. 2018). [Site internet](#)
- Science Organizing Comitee et co-organisateur de l'atelier **Optimal Optical Coronagraphs** (Leiden, NL, Sep. 2017). [Site internet](#)
- *Science Organizing Comitee* de l'atelier **High Contrast Imaging from Space** (Baltimore, MD, US, Nov 2016). [Site internet](#)
- Co-organisateur de l'atelier **La très haute dynamique** (Paris, Fr, Oct. 2012)

### Autres investissements

- Participation au **Telescope Allocation Committee** d'Hubble (2 semaines, Mai 2016).
- Membre du Study Analysis Groups (SAGs) #19 de l'**Exoplanet Exploration Program Analysis Group** (ExoPAG). Le SAG numéro 19 regroupe des chercheurs pour définir de nouvelles métriques d'évaluation et de comparaison des méthodes de détection d'exoplanètes (Jensen Clem et al. 2017).
- Organisation du séminaire **"Exoplanet, Star and Planet Formation"** au STScI (2016 - 2018). Ce séminaire invite des chercheurs d'autres organismes chaque semaine au STScI.
- Développement du **site internet du banc optique THD** de Meudon en Août 2014, dans l'objectif de faire connaître ses caractéristiques à l'international pour créer de nouvelles collaborations.
- Membre de l'IAU depuis 2019
- **Peer-review** pour le *Astronomical Journal*, *A&A*, *MNRAS*, *PASP* et *Journal of Astronomical Telescopes, Instruments, and Systems*.

# LISTE DES PUBLICATIONS

## 1 PRINCIPAUX ARTICLES

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1. **Mazoyer, J.** ; Pueyo, L. ; N'Diaye, M. et al. (2018), *Active Correction of Aperture Discontinuities-Optimized Stroke Minimization. II. Optimization for Future Missions*, The Astronomical Journal, 155, 8, [DOI Link](#), 8 citations
2. **Mazoyer, J.** ; Pueyo, L. ; N'Diaye, M. et al. (2018), *Active Correction of Aperture Discontinuities-Optimized Stroke Minimization. I. A New Adaptive Interaction Matrix Algorithm*, The Astronomical Journal, 155, 7, [DOI Link](#), 7 citations
3. Fogarty, K. ; Pueyo, L. ; **Mazoyer, J.** et al. (2017), *Polynomial Apodizers for Centrally Obscured Vortex Coronagraphs*, The Astronomical Journal, 154, 240, [DOI Link](#), 6 citations
4. **Mazoyer, J.** ; Pueyo, L. ; Norman, C. et al. (2016), *Active compensation of aperture discontinuities for WFIRST-AFTA: analytical and numerical comparison of propagation methods and preliminary results with a WFIRST-AFTA-like pupil*, Journal of Astronomical Telescopes, Instruments, and Systems, 2, 011008, [DOI Link](#), 8 citations
5. **Mazoyer, J.** ; Boccaletti, A. ; Choquet, É. et al. (2016), *A Symmetric Inner Cavity in the HD 141569A Circumstellar Disk*, The Astrophysical Journal, 818, 150, [DOI Link](#), 11 citations
6. **Mazoyer, J.** ; Boccaletti, A. ; Augereau, J. -C. et al. (2014), *Is the HD 15115 inner disk really asymmetrical?*, Astronomy and Astrophysics, 569, A29, [DOI Link](#), 29 citations
7. **Mazoyer, J.** ; Baudoz, P. ; Galicher, R. et al. (2014), *High-contrast imaging in polychromatic light with the self-coherent camera*, Astronomy and Astrophysics, 564, L1, [DOI Link](#), 26 citations
8. **Mazoyer, J.** ; Baudoz, P. ; Galicher, R. et al. (2013), *Estimation and correction of wavefront aberrations using the self-coherent camera: laboratory results*, Astronomy and Astrophysics, 557, A9, [DOI Link](#), 27 citations

## 2 AUTRES ARTICLES

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1. Ertel, S. ; Defrère, D. ; Hinz, P. et al. (2020), *The HOSTS Survey for Exozodiacal Dust: Observational Results from the Complete Survey*, The Astronomical Journal, 159, 177, [DOI Link](#), 1 citation
2. Bruzzone, J. S. ; Metchev, S. ; Duchêne, G. et al. (2020), *Imaging the 44 au Kuiper Belt Analog Debris Ring around HD 141569A with GPI Polarimetry*, The Astronomical Journal, 159, 53, [DOI Link](#), 1 citation
3. Hom, J. ; Patience, J. ; Esposito, T. M. et al. (2020), *First Resolved Scattered-light Images of Four Debris Disks in Scorpius-Centaurus with the Gemini Planet Imager*, The Astronomical Journal, 159, 31, [DOI Link](#), 1 citation
4. Bhowmik, T. ; Boccaletti, A. ; Thébault, P. et al. (2019), *Spatially resolved spectroscopy of the debris disk HD 32297. Further evidence of small dust grains*, Astronomy and Astrophysics, 630, A85, [DOI Link](#), 9 citations
5. Ren, B. ; Choquet, É. ; Perrin, M. D. et al. (2019), *An Exo-Kuiper Belt with an Extended Halo around HD 191089 in Scattered Light*, The Astrophysical Journal, 882, 64, [DOI Link](#), 6 citations
6. Stark, C. C. ; Belikov, R. ; Bolcar, M. R. et al. (2019), *ExoEarth yield landscape for future direct imaging space telescopes*, Journal of Astronomical Telescopes, Instruments, and Systems, 5, 024009, [DOI Link](#), 4 citations

7. Engler, N. ; Boccaletti, A. ; Schmid, H. M. et al. (2019), *Investigating the presence of two belts in the HD 15115 system*, Astronomy and Astrophysics, 622, A192, [DOI Link](#), 7 citations
8. Esposito, T. M. ; Duchêne, G. ; Kalas, P. et al. (2018), *Direct Imaging of the HD 35841 Debris Disk: A Polarized Dust Ring from Gemini Planet Imager and an Outer Halo from HST/STIS*, The Astronomical Journal, 156, 47, [DOI Link](#), 9 citations
9. Leboulleux, L. ; Sauvage, J. -F. ; Pueyo, L. A. et al. (2018), *Pair-based Analytical model for Segmented Telescopes Imaging from Space for sensitivity analysis*, Journal of Astronomical Telescopes, Instruments, and Systems, 4, 035002, [DOI Link](#), 2 citations
10. Poteet, C. A. ; Chen, C. H. ; Hines, D. C. et al. (2018), *Space-based Coronagraphic Imaging Polarimetry of the TW Hydrae Disk: Shedding New Light on Self-shadowing Effects*, The Astrophysical Journal, 860, 115, [DOI Link](#), 4 citations
11. Jensen-Clem, R. ; Mawet, D. ; Gomez Gonzalez, C. A. et al. (2018), *A New Standard for Assessing the Performance of High Contrast Imaging Systems*, The Astronomical Journal, 155, 19, [DOI Link](#), 13 citations
12. Perrot, C. ; Boccaletti, A. ; Pantin, E. et al. (2016), *Discovery of concentric broken rings at sub-arcsec separations in the HD 141569A gas-rich, debris disk with VLT/SPHERE*, Astronomy and Astrophysics, 590, L7, [DOI Link](#), 27 citations
13. Delorme, J. R. ; Galicher, R. ; Baudoz, P. et al. (2016), *Focal plane wavefront sensor achromatization: The multireference self-coherent camera*, Astronomy and Astrophysics, 588, A136, [DOI Link](#), 10 citations
14. Choquet, É. ; Perrin, M. D. ; Chen, C. H. et al. (2016), *First Images of Debris Disks around TWA 7, TWA 25, HD 35650, and HD 377*, The Astrophysical Journal, 817, L2, [DOI Link](#), 45 citations
15. Debes, J. H. ; Ygouf, M. ; Choquet, E. et al. (2016), *Wide-Field Infrared Survey Telescope-Astrophysics Focused Telescope Assets coronagraphic operations: lessons learned from the Hubble Space Telescope and the James Webb Space Telescope*, Journal of Astronomical Telescopes, Instruments, and Systems, 2, 011010, [DOI Link](#), 9 citations
16. Wiens, R. C. ; Maurice, S. ; Lasue, J. et al. (2013), *Pre-flight calibration and initial data processing for the ChemCam laser-induced breakdown spectroscopy instrument on the Mars Science Laboratory rover*, Spectrochimica Acta, 82, 1, [DOI Link](#), 126 citations
17. Cousin, A. ; Forni, O. ; Maurice, S. et al. (2011), *Laser induced breakdown spectroscopy library for the Martian environment*, Spectrochimica Acta, 66, 805, [DOI Link](#), 44 citations

### 3 MANUSCRIT DE THESE

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- **Mazoyer, J.** (2014), *High-Contrast Direct Imaging of Exoplanets and Circumstellar Disks: From the Self-Coherent Camera to NICI Data Analysis*, Ph.D. Thesis, [DOI Link](#), 2 citations

### 4 PRINCIPAUX ACTES DE CONFERENCES

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1. Fogarty, K. ; **Mazoyer, J.** ; St. Laurent, K. et al. (2018), *Optimal deformable mirror and pupil apodization combinations for apodized pupil Lyot coronagraphs with obstructed pupils*, Space Telescopes and Instrumentation 2018: Optical, Infrared, and Millimeter Wave, 10698, 106981J, [DOI Link](#), 1 citation

2. Ruane, G. ; Riggs, A. ; **Mazoyer, J.** et al. (2018), *Review of high-contrast imaging systems for current and future ground- and space-based telescopes I: coronagraph design methods and optical performance metrics*, Space Telescopes and Instrumentation 2018: Optical, Infrared, and Millimeter Wave, 10698, 106982S, [DOI Link](#), 2 citations
3. **Mazoyer, J.** ; Pueyo, L. ; N'Diaye, M. et al. (2017), *Capabilities of ACAD-OSM, an active method for the correction of aperture discontinuities*, Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 10400, 104000G, [DOI Link](#), 2 citations
4. **Mazoyer, J.** ; Pueyo, L. (2017), *Fundamental limits to high-contrast wavefront control*, Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 10400, 1040014, [DOI Link](#), 1 citation
5. Lebouilleux, L. ; N'Diaye, M. ; **Mazoyer, J.** et al. (2017), *Comparison of wavefront control algorithms and first results on the high-contrast imager for complex aperture telescopes (hicat) testbed*, Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 10562, 105622Z, [DOI Link](#)
6. Fogarty, K. ; Pueyo, L. ; **Mazoyer, J.** et al. (2017), *Tip/tilt optimizations for polynomial apodized vortex coronagraphs on obscured telescope pupils*, Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 10400, 104000T, [DOI Link](#), 2 citations
7. **Mazoyer, J.** ; Pueyo, L. ; N'Diaye, M. et al. (2016), *Correcting for the effects of pupil discontinuities with the ACAD method*, Space Telescopes and Instrumentation 2016: Optical, Infrared, and Millimeter Wave, 9904, 99044T, [DOI Link](#), 1 citation
8. **Mazoyer, J.** ; Pueyo, L. ; Norman, C. et al. (2015), *Active correction of aperture discontinuities (ACAD) for space telescope pupils: a parametric analysis*, Techniques and Instrumentation for Detection of Exoplanets VII, 9605, 96050M, [DOI Link](#), 9 citations
9. N'Diaye, M. ; **Mazoyer, J.** ; Choquet, É. et al. (2015), *High-contrast imager for complex aperture telescopes (HiCAT): 3. first lab results with wavefront control*, Techniques and Instrumentation for Detection of Exoplanets VII, 9605, 96050I, [DOI Link](#), 7 citations
10. **Mazoyer, J.** ; Boccaletti, A. ; Augereau, J. -C. et al. (2014), *Is the HD 15115 circumstellar disk really asymmetrical?*, Thirty years of Beta Pic and Debris Disks Studies, 47
11. **Mazoyer, J.** ; Galicher, R. ; Baudoz, P. et al. (2014), *Deformable mirror interferometric analysis for the direct imagery of exoplanets*, Adaptive Optics Systems IV, 9148, 914846, [DOI Link](#), 1 citation
12. **Mazoyer, J.** ; Baudoz, P. ; Galicher, R. et al. (2013), *Direct detection of exoplanets in polychromatic light with a Self-coherent camera*, Proceedings of the Third AO4ELT Conference, 97, [DOI Link](#)
13. Baudoz, P. ; **Mazoyer, J.** ; Galicher, R. (2013), *Laboratory tests of planet signal extraction in high contrast images*, Proceedings of the Third AO4ELT Conference, 109, [DOI Link](#), 1 citation
14. **Mazoyer, J.** ; Galicher, R. ; Baudoz, P. et al. (2013), *Speckle correction in polychromatic light with the self-coherent camera for the direct detection of exoplanets*, Techniques and Instrumentation for Detection of Exoplanets VI, 8864, 88640N, [DOI Link](#), 1 citation
15. Galicher, R. ; **Mazoyer, J.** ; Baudoz, P. et al. (2013), *High-contrast imaging with a self-coherent camera*, Techniques and Instrumentation for Detection of Exoplanets VI, 8864, 88640M, [DOI Link](#)
16. Baudoz, P. ; **Mazoyer, J.** ; Mas, M. et al. (2012), *Dark hole and planet detection: laboratory results using the self-coherent camera*, Ground-based and Airborne Instrumentation for Astronomy IV, 8446, 84468C, [DOI Link](#), 11 citations
17. Mas, M. ; Baudoz, P. ; **Mazoyer, J.** et al. (2012), *Experimental results on wavefront correction using the self-coherent camera*, Ground-based and Airborne Instrumentation for Astronomy IV, 8446, 844689, [DOI Link](#), 4 citations



18. **Mazoyer, J.** ; Baudoz, P. ; Mas, M. et al. (2012), *Experimental parametric study of the self-coherent camera*, Space Telescopes and Instrumentation 2012: Optical, Infrared, and Millimeter Wave, 8442, 844250, [DOI Link](#), 2 citations
19. Gasnault, O. ; **Mazoyer, J.** ; Cousin, A. et al. (2012), *Deciphering Sample and Atmospheric Oxygen Contents with ChemCam on Mars*, Lunar and Planetary Science Conference, 2888, 1 citation

## 5 AUTRES ACTES DE CONFERENCES

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1. N'Diaye, M. ; Fogarty, K. ; Soummer, R. et al. (2018), *Apodized Pupil Lyot coronagraphs with arbitrary aperture telescopes: novel designs using hybrid focal plane masks*, Space Telescopes and Instrumentation 2018: Optical, Infrared, and Millimeter Wave, 10698, 106986A, [DOI Link](#)
2. Soummer, R. ; Brady, G. R. ; Brooks, K. et al. (2018), *High-contrast imager for complex aperture telescopes (HiCAT): 5. first results with segmented-aperture coronagraph and wavefront control*, Space Telescopes and Instrumentation 2018: Optical, Infrared, and Millimeter Wave, 10698, 106981O, [DOI Link](#)
3. Snik, F. ; Absil, O. ; Baudoz, P. et al. (2018), *Review of high-contrast imaging systems for current and future ground-based and space-based telescopes III: technology opportunities and pathways*, Advances in Optical and Mechanical Technologies for Telescopes and Instrumentation III, 10706, 107062L, [DOI Link](#), 2 citations
4. St. Laurent, K. ; Fogarty, K. ; Zimmerman, N. T. et al. (2018), *Apodized pupil Lyot coronagraphs designs for future segmented space telescopes*, Space Telescopes and Instrumentation 2018: Optical, Infrared, and Millimeter Wave, 10698, 106982W, [DOI Link](#)
5. Jovanovic, N. ; Absil, O. ; Baudoz, P. et al. (2018), *Review of high-contrast imaging systems for current and future ground-based and space-based telescopes: Part II. Common path wavefront sensing/control and coherent differential imaging*, Adaptive Optics Systems VI, 10703, 107031U, [DOI Link](#), 4 citations
6. Lebouilleux, L. ; Pueyo, L. ; Sauvage, J. -F. et al. (2018), *Sensitivity analysis for high-contrast imaging with segmented space telescopes*, Space Telescopes and Instrumentation 2018: Optical, Infrared, and Millimeter Wave, 10698, 106986H, [DOI Link](#)
7. Egron, S. ; Soummer, R. ; Lajoie, C. -P. et al. (2017), *James Webb Space Telescope optical simulation testbed IV: linear control alignment of the primary segmented mirror*, Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 10398, 1039811, [DOI Link](#)
8. Pueyo, L. ; Zimmerman, N. ; Bolcar, M. et al. (2017), *The LUVOIR architecture "A" coronagraph instrument*, Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 10398, 103980F, [DOI Link](#), 6 citations
9. Lebouilleux, L. ; N'Diaye, M. ; Riggs, A. J. E. et al. (2016), *High-contrast imager for Complex Aperture Telescopes (HiCAT). 4. Status and wavefront control development*, Space Telescopes and Instrumentation 2016: Optical, Infrared, and Millimeter Wave, 9904, 99043C, [DOI Link](#)
10. Galicher, R. ; Baudoz, P. ; Delorme, J. R. et al. (2014), *High contrast imaging on the THD bench: progress and upgrades*, Space Telescopes and Instrumentation 2014: Optical, Infrared, and Millimeter Wave, 9143, 91435A, [DOI Link](#), 1 citation
11. Delorme, J. R. ; Galicher, R. ; Baudoz, P. et al. (2014), *High-contrast imaging in wide spectral band with a self-coherent camera and achromatic coronagraphs*, Advances in Optical and Mechanical Technologies for Telescopes and Instrumentation, 9151, 91515Q, [DOI Link](#), 1 citation
12. Galicher, R. ; Delorme, J. R. ; Baudoz, P. et al. (2013), *Focal Plane Wavefront Sensing with a self-coherent camera*, Proceedings of the Third AO4ELT Conference, 123, [DOI Link](#)

## 6 PAPIERS BLANCS (SELECTION)

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- Boccaletti, A. ; Chauvin, G. ; Mouillet, D. et al. (2020), *SPHERE+: Imaging young Jupiters down to the snowline*, arXiv e-prints, [arXiv:2003.05714](#)
- Gaudi, B. S. ; Seager, S. ; Mennesson, B. et al. (2020), *The Habitable Exoplanet Observatory (HabEx) Mission Concept Study Final Report*, arXiv e-prints, [arXiv:2001.06683](#)
- The LUVOIR Team (2019), *The LUVOIR Mission Concept Study Final Report*, arXiv e-prints, [arXiv:1912.06219](#)
- Mazoyer, J. ; Baudoz, P. ; Belikov, R. et al. (2019), *High-Contrast Testbeds for Future Space-Based Direct Imaging Exoplanet Missions*, Bulletin of the American Astronomical Society, 51, 101, [arXiv:1907.09508](#)