## Contents

xvii Authors  
xxvii Conference Committee  

### Part One

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>10703 02</td>
<td>Adaptive Optics Facility: from an amazing present to a brilliant future...</td>
<td>10703-3</td>
</tr>
<tr>
<td>10703 03</td>
<td>The ERIS adaptive optics system: from design to hardware</td>
<td>10703-2</td>
</tr>
<tr>
<td>10703 04</td>
<td>The CHARA array adaptive optics program</td>
<td>10703-4</td>
</tr>
</tbody>
</table>

### Session 2  ASTRONOMY WITH AO

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>10703 05</td>
<td>Two decades of exoplanetary science with adaptive optics (Invited Paper)</td>
<td>10703-5</td>
</tr>
<tr>
<td>10703 06</td>
<td>Keck Planet Imager and Characterizer: status update</td>
<td>10703-6</td>
</tr>
<tr>
<td>10703 07</td>
<td>LASSO: Large Adaptive optics Survey for Substellar Objects using the new SAPHIRA detector on Robo-AO</td>
<td>10703-7</td>
</tr>
</tbody>
</table>

### Session 3  AO SYSTEMS AND STATUS II

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>10703 09</td>
<td>MagAO-X: project status and first laboratory results</td>
<td>10703-9</td>
</tr>
<tr>
<td>10703 0A</td>
<td>Adaptive optics systems at the Large Binocular Telescope: status, upgrades, and improvements</td>
<td>10703-10</td>
</tr>
<tr>
<td>10703 0B</td>
<td>Commissioning multi-conjugate adaptive optics with LINC-NIRVANA on LBT</td>
<td>10703-11</td>
</tr>
<tr>
<td>10703 0C</td>
<td>GTC adaptive optics first performance tests in laboratory</td>
<td>10703-12</td>
</tr>
<tr>
<td>10703 0E</td>
<td>SHARK-NIR: the coronagraphic camera for LBT in the AIV phase at INAF-Padova</td>
<td>10703-14</td>
</tr>
</tbody>
</table>
Laboratory integration of the DKIST wavefront correction system (Invited Paper) [10703-15]

Progress on solar multi-conjugate adaptive optics at the New Vacuum Solar Telescope [10703-16]

SESSION 4  POST-PROCESSING AO DATA

Mining the GPIES database [10703-17]

Point-spread function reconstruction for integral-field spectrograph data [10703-18]

SESSION 5  AO SYSTEMS AND STATUS III

On-sky results from the wide-field ground-layer adaptive optics demonstrator ‘imaka [10703-19]

The Gemini Planet Imager: looking back over five years and forward to the future [10703-20]

Status of MagAO and review of astronomical science with visible light adaptive optics [10703-21]

On-going and future AO activities on Subaru Telescope [10703-22]

Ground layer adaptive optics for the W. M. Keck Observatory: feasibility study [10703-23]

SESSION 6  AO SYSTEMS AND STATUS IV

Adaptive optics tracking and pushing system for space debris manoeuvre [10703-24]

An infusion of new blood using the Toptica laser with GeMS: results of the commissioning and science performance [10703-25]

SESSION 7  LGS

LGS alternative wave-front sensing: Projected Pupil Plane Pattern (PPPP) [10703-26]

Studies towards a directional polychromatic sodium laser guide star [10703-28]

A 100-W 1178-nm continuous-wave single-frequency linearly polarized Raman fiber amplifier [10703-29]
### SESSION 8  AO FOR ELTs I

| 10703 0W | An overview and status of GMT active and adaptive optics (Invited Paper) [10703-33] |
| 10703 0X | Preliminary on-sky results of the next generation GMT phasing sensor prototype [10703-34] |
| 10703 0Y | Adaptive optics program at TMT (Invited Paper) [10703-35] |
| 10703 0Z | Wavefront control architecture and expected performance for the TMT Planetary Systems Imager [10703-36] |

### SESSION 9  AO FOR ELTs II

| 10703 10 | Adaptive optics at the ESO ELT (Invited Paper) [10703-37] |
| 10703 11 | MAORY for ELT: preliminary design overview [10703-38] |
| 10703 13 | The MICADO first-light imager for the ELT: towards the preliminary design review of the MICADO-MAORY SCAO [10703-40] |
| 10703 14 | Single conjugate adaptive optics for METIS [10703-41] |
| 10703 15 | Status of the preparatory work for the 4m European Solar Telescope [10703-42] |
| 10703 16 | Phase A AO system design and performance for MOSAIC at the ELT [10703-43] |
| 10703 17 | The Real-Time controller (RTC) for the Narrow Field Infrared Adaptive Optics System (NFIRAOS) for TMT final design [10703-44] |
| 10703 18 | Prototyping AO RTC using emerging high performance computing technologies with the Green Flash project [10703-45] |
| 10703 19 | An ELT scale MCAO real-time control prototype using Xeon Phi technologies [10703-46] |
| 10703 1A | A calibration source for ELT AO systems [10703-47] |
### SESSION 10  ADVANCES IN AO CONTROL I

| 10703 1B | Overview of multi-conjugate adaptive optics reconstructors (Invited Paper) [10703-48] |
| 10703 1D | Dealing with spiders on ELTs: using a Pyramid WFS to overcome residual piston effects [10703-50] |
| 10703 1E | The compute and control for adaptive optics (CACAO) real-time control software package [10703-51] |
| 10703 1F | Wavefront reconstruction and prediction with convolutional neural networks [10703-52] |

### SESSION 11  ADVANCES IN AO CONTROL II

| 10703 1G | The AO in AOF (Invited Paper) [10703-53] |
| 10703 1H | Adaptive gain in closed-loop tilt control and adaptive optics [10703-54] |
| 10703 1I | Innovative real-time processing for solar adaptive optics [10703-55] |
| 10703 1J | Status of point spread function determination for Keck adaptive optics [10703-59] |
| 10703 1K | The multi-object adaptive optics system for the GIRMOS spectrograph on Gemini-South [10703-56] |
| 10703 1M | Advanced control laws for the new generation of AO systems (Invited Paper) [10703-58] |

### SESSION 12  POINT SPREAD FUNCTION RECONSTRUCTION

| 10703 1N | LLAMAS: low-latency adaptive optics at LLNL [10703-60] |
| 10703 1O | Off-axis PSF reconstruction for integral field spectrograph: instrumental aberrations and application to Keck/OSIRIS data [10703-61] |

### SESSION 13  EXTREME AO

| 10703 1Q | Statistical analysis and lessons learned of SPHERE adaptive optics performance [10703-63] |
| 10703 1S | A laser communication adaptive optics system as a testbed for extreme adaptive optics [10703-65] |
**SESSION 14  WAVEFRONT SENSING**

| 10703 1U | 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 (Invited Paper) [10703-67] |
| 10703 1V | C-RED 2 InGaAs 640×512 600-fps infrared camera for low order wavefront sensing [10703-68] |
| 10703 1W | Update on development of WFS cameras at ESO for the ELT [10703-69] |
| 10703 1X | Error breakdown of ELT-elongated LGS wavefront-sensing using CANARY on-sky measurements [10703-70] |

**Part Two**

| 10703 1Y | The MAORY laser guide star wavefront sensor: design status [10703-71] |
| 10703 1Z | Adaptive optics with an infrared pyramid wavefront sensor (Invited Paper) [10703-72] |
| 10703 20 | A modal approach to optical gain compensation for the pyramid wavefront sensor [10703-73] |
| 10703 21 | Design of the MagAO-X pyramid wavefront sensor [10703-74] |
| 10703 22 | Analysis and mitigation of pupil discontinuities on adaptive optics performance [10703-75] |

**SESSION 15  PATHFINDERS FOR AO**

| 10703 23 | On-sky results of the Leiden EXoplanet Instrument (LEXI) [10703-76] |
| 10703 24 | A conceptual design study for Subaru ULTIMATE GLAO [10703-77] |
| 10703 25 | Closed loop operation with extremely elongated LGS spots in CANARY Phase D [10703-78] |
| 10703 26 | From Clear to DKIST: advancing solar MCAO from 1.6 to 4 meters [10703-79] |
| 10703 27 | The Robo-AO-2 facility for rapid visible/near-infrared AO imaging and the demonstration of hybrid techniques [10703-80] |
| 10703 28 | The Copernico Telescope testing facility for AO on-sky demonstrations [10703-81] |
SESSION 16  CHARACTERIZATION, MEASUREMENT AND MODELING OF THE DISTURBANCES FACED BY AO

10703 2A  Low wind effect on VLT/SPHERE: impact, mitigation strategy, and results (Invited Paper) [10703-83]
10703 2B  Optimizing multi-LGS WFS AO performance in the context of sodium profile evolution and non-common path aberration [10703-84]
10703 2C  Implications for contrast as a result of the wind vector and non-stationary turbulence [10703-85]
10703 2D  An on-line turbulence profiler for the AOF: on-sky results [10703-86]
10703 2E  Representative atmospheric turbulence profiles for ESO Paranal [10703-87]
10703 2G  Point spread function reconstruction coupling AO telemetry and focal plane images [10703-89]

SESSION 17  WAVEFRONT CORRECTORS

10703 2H  Prototyping of large deformable mirrors for TMT: test results [10703-91]

POSTER SESSION: ASTRONOMY WITH AO

10703 2J  Exploring the performance of a GMCAO-equipped ELT within the deep field surveys strategy [10703-93]
10703 2K  Upgrading the MMT AO system with a near-infrared pyramid wavefront sensor [10703-94]
10703 2L  In-lab testing of six-level phase mask coronagraphs onto the high-contrast imaging THD2 bench [10703-95]
10703 2M  Surveying the Epsilon Eridani system Using MagAO [10703-96]
10703 2N  Real-time estimation and correction of quasi-static aberrations in ground-based high contrast imaging systems with high frame-rates [10703-97]
10703 2P  Development of elements for an adaptive optics system for solar telescope [10703-99]
10703 2Q  A locking clamp that enables high thermal and vibrational stability for kinematic optical mounts [10703-100]
**POSTER SESSION: POST-PROCESSING AO DATA**

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>10703 2R</td>
<td>Exoplanet detection in angular and spectral differential imaging: local learning of background correlations for improved detections</td>
<td>[10703-101]</td>
</tr>
<tr>
<td>10703 2T</td>
<td>The hunt for Sirius Ab: comparison of algorithmic sky and PSF estimation performance in deep coronagraphic thermal-IR high contrast imaging</td>
<td>[10703-103]</td>
</tr>
<tr>
<td>10703 2U</td>
<td>Fast cadence speckle-free high-contrast imaging: SFADI and SFI</td>
<td>[10703-104]</td>
</tr>
<tr>
<td>10703 2V</td>
<td>Recurrence quantification analysis as a post-processing technique in adaptive optics high contrast imaging</td>
<td>[10703-105]</td>
</tr>
<tr>
<td>10703 2Z</td>
<td>Slope-based wavefront sensor optimisation with multi-resolution analysis</td>
<td>[10703-109]</td>
</tr>
<tr>
<td>10703 31</td>
<td>Approximate nonnegative matrix factorization algorithm for the analysis of angular differential imaging data</td>
<td>[10703-111]</td>
</tr>
<tr>
<td>10703 32</td>
<td>Parallel processing of solar image restoration with phase diversity technique</td>
<td>[10703-112]</td>
</tr>
</tbody>
</table>

**POSTER SESSION: AO SYSTEMS AND STATUS**

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>10703 33</td>
<td>Adaptive optics corrected imaging for satellite and debris characterisation</td>
<td>[10703-113]</td>
</tr>
<tr>
<td>10703 36</td>
<td>Experiments of GLAO using the domeless solar telescope of the Hida Observatory</td>
<td>[10703-116]</td>
</tr>
<tr>
<td>10703 38</td>
<td>Preliminary design of SALTO: the Belgian adaptive optics demonstrator</td>
<td>[10703-118]</td>
</tr>
<tr>
<td>10703 39</td>
<td>A near-infrared pyramid wavefront sensor for Keck adaptive optics: real-time controller</td>
<td>[10703-119]</td>
</tr>
<tr>
<td>10703 3A</td>
<td>Upgrades to the AO system of the 1.5m Gregor solar telescope</td>
<td>[10703-120]</td>
</tr>
<tr>
<td>10703 3B</td>
<td>First version of the fiber injection unit for the Keck Planet Imager and Characterizer</td>
<td>[10703-121]</td>
</tr>
<tr>
<td>10703 3C</td>
<td>SAMplus: adaptive optics at optical wavelengths for SOAR</td>
<td>[10703-122]</td>
</tr>
<tr>
<td>10703 3D</td>
<td>The Gran Telescopio Canarias laser guide star AO system: error budget and expected performance</td>
<td>[10703-123]</td>
</tr>
<tr>
<td>10703 3E</td>
<td>High-contrast observations of circumstellar environments with GTC/FRIDA: design and study of the coronagraphic devices</td>
<td>[10703-125]</td>
</tr>
<tr>
<td>10703 3F</td>
<td>Servo control simulations and preliminary laboratory results for GTC adaptive optics with NGS</td>
<td>[10703-126]</td>
</tr>
<tr>
<td>Session</td>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>3G</td>
<td>Near-infrared pyramid wavefront sensor for Keck adaptive optics: opto-mechanical design</td>
<td>127</td>
</tr>
<tr>
<td>3I</td>
<td>Control electronics of the ERIS AO and CU subsystems</td>
<td>129</td>
</tr>
<tr>
<td>3J</td>
<td>Electronics design of the LOR WFS module of MAORY</td>
<td>130</td>
</tr>
<tr>
<td>3L</td>
<td>Design of a laser guide star wavefront sensor system for NFIRAOS</td>
<td>132</td>
</tr>
<tr>
<td>3N</td>
<td>Dueling lasers! A comparative analysis of two different sodium laser technologies on sky</td>
<td>134</td>
</tr>
<tr>
<td>3P</td>
<td>Current status of the laser guide star upgrade at Subaru Telescope</td>
<td>136</td>
</tr>
<tr>
<td>3R</td>
<td>Simulations of continuous-wave sodium laser guide stars with polarization modulation at Larmor frequency</td>
<td>138</td>
</tr>
<tr>
<td>3S</td>
<td>Confirmation of laser-induced Raman scattering at Cerro Pachón</td>
<td>139</td>
</tr>
<tr>
<td>3T</td>
<td>Switching between two laser guide star facilities: an overview of the optomechanical design for the new laser beam injector at the Gemini South Observatory</td>
<td>141</td>
</tr>
</tbody>
</table>

**POSTER SESSION: LASER GUIDE STAR SYSTEMS**

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3V</td>
<td>NFIRAOS adaptive optics for the Thirty Meter Telescope</td>
<td>144</td>
</tr>
<tr>
<td>3X</td>
<td>Opto-mechanical designs for the HARMONI adaptive optics systems</td>
<td>146</td>
</tr>
<tr>
<td>3Y</td>
<td>Extending the pyramid WFS to LGSs: the INGOT WFS</td>
<td>147</td>
</tr>
<tr>
<td>40</td>
<td>Line of sight mesospheric sodium profiles obtained from the LGS signal for optimal ELT LGS-AO</td>
<td>150</td>
</tr>
<tr>
<td>41</td>
<td>ELT-HIRES the high resolution spectrograph for the ELT: implementing exoplanet atmosphere reflection detection with a SCAO module</td>
<td>151</td>
</tr>
<tr>
<td>42</td>
<td>High Contrast Imaging for Python (HCIPy): an open-source adaptive optics and coronagraph simulator</td>
<td>152</td>
</tr>
<tr>
<td>43</td>
<td>MAORY real-time computer preliminary design</td>
<td>153</td>
</tr>
<tr>
<td>44</td>
<td>Wavefront reconstruction for ELT-sized telescopes with pyramid wavefront sensors</td>
<td>154</td>
</tr>
</tbody>
</table>
Fitting error analysis and performance evaluation of M4 deformable mirror [10703-155]

LO WFS of MAORY: performance and sky coverage assessment [10703-156]

Real-time end-to-end AO simulations at ELT scale on multiple GPUs with the COMPASS platform [10703-157]

The real time MCAO solar prototype for the EST [10703-158]

Point spread function reconstruction simulations for laser guide star multi-conjugate adaptive optics on extremely large telescopes [10703-159]

Modeling of PSF corrected by adaptive optics systems [10703-160]

Design and performance of a scalable GPU-based AO RTC prototype [10703-161]

Status of the preliminary design of the NGS WFS subsystem of MAORY [10703-164]

Vibration environment of the LBTO/AO system [10703-166]

Next generation adaptive optics: a low-voltage ASIC driver for MEMS deformable mirrors [10703-167]

MAORY for ELT: preliminary mechanical design of the support structure [10703-168]

Numerical simulations of MAORY MCAO module for the ELT [10703-169]

MAORY requirements flow down and technical budgets [10703-265]

Estimation of polarization aberrations and its effect on the point spread function of the Thirty Meter Telescope [10703-266]

Part Three

POSTER SESSION: ADVANCES IN AO CONTROL

Scalable soft real-time supervisor for tomographic AO [10703-170]

Fourier wavefront reconstruction with a pyramid wavefront sensor [10703-171]

Optimization of contrast in adaptive optics for exoplanet imaging [10703-172]

Rolling shutter detector data flow strategies to push the limits of AO performance [10703-173]
**POSTER SESSION: EXTREME AO**

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>10703 4P</td>
<td>Analysis of AO modeling for pseudo-synthetic interaction matrix at the LBT [10703-174]</td>
</tr>
<tr>
<td>10703 4R</td>
<td>The calibration procedure of the LINC-NIRVANA ground and high layer WFS [10703-176]</td>
</tr>
<tr>
<td>10703 4S</td>
<td>Geometric distortion calibration using a pinhole mask [10703-177]</td>
</tr>
<tr>
<td>10703 4T</td>
<td>High level adaptive optics supervision software for fast transition to optimal performance [10703-178]</td>
</tr>
<tr>
<td>10703 4U</td>
<td>An integrated identification and predictive control strategy for high wind velocity adaptive optics applications [10703-179]</td>
</tr>
<tr>
<td>10703 4V</td>
<td>Adaptive optics for high precision polarimetry: preliminary tests of DM polarization [10703-180]</td>
</tr>
<tr>
<td>10703 4W</td>
<td>EMCCD in-situ periodic characterization in Shack-Hartmann wavefront sensor for GTCAO [10703-182]</td>
</tr>
<tr>
<td>10703 4Y</td>
<td>Optical and mechanical design of the extreme AO coronagraphic instrument MagAO-X [10703-184]</td>
</tr>
<tr>
<td>10703 4Z</td>
<td>Modeling coronagraphic extreme wavefront control systems for high contrast imaging in ground and space telescope missions [10703-185]</td>
</tr>
<tr>
<td>10703 50</td>
<td>Subaru Coronagraphic Extreme-AO (SCExAO) wavefront control: current status and ongoing developments [10703-187]</td>
</tr>
<tr>
<td>10703 51</td>
<td>Fast focal plane wavefront sensing on ground-based telescopes [10703-188]</td>
</tr>
<tr>
<td>10703 54</td>
<td>Nonlinear estimation with a pyramid wavefront sensor [10703-191]</td>
</tr>
<tr>
<td>10703 55</td>
<td>Optical field/pupil rotator with a novel compact K-mirror for MagAO-X [10703-192]</td>
</tr>
<tr>
<td>10703 56</td>
<td>Air, telescope, and instrument temperature effects on the Gemini Planet Imager's image quality [10703-267]</td>
</tr>
<tr>
<td>10703 57</td>
<td>The segmented pupil experiment for exoplanet detection: Part 3. Advances and first light with segments cophasing [10703-268]</td>
</tr>
<tr>
<td>10703 58</td>
<td>Optimizing optics and opto-mechanical mounting to minimize static aberrations in high-contrast instruments [10703-269]</td>
</tr>
<tr>
<td>10703 59</td>
<td>SCExAO, an instrument with a dual purpose: perform cutting-edge science and develop new technologies [10703-270]</td>
</tr>
<tr>
<td>10703 5A</td>
<td>Characterization of deformable mirrors for the MagAO-X project [10703-272]</td>
</tr>
</tbody>
</table>
Stirling cycle cryocooler exported vibration analysis [10703-274]

Effect of multiple deformable mirrors in broadband high-contrast coronagraphs [10703-275]

**POSTER SESSION: WAVEFRONT SENSING**

Effects of the telescope spider on extreme adaptive optics systems with pyramid wavefront sensors [10703-198]

Solar MCAO with a single sensor: simulating tomographic reconstruction with the plenoptic camera [10703-205]

Demonstration of a photonic lantern low order wavefront sensor using an adaptive optics testbed [10703-202]

The latency measurement of wavefront sensor camera and its impact on the performance of an adaptive optical system [10703-209]

Low light level quadriwave lateral shearing interferometer for in-situ wavefront sensing [10703-210]

On-sky verification of a solution to the MCAO partial illumination issue and wind-predictive wavefront control [10703-195]

Application of phase diversity to estimate the non-common path aberrations in the Gemini planet imager: results from simulation and real data [10703-204]

On-sky compensation of non-common path aberrations with the ZELDA wavefront sensor in VLT/SPHERE [10703-206]

The DKIST low order wavefront sensor [10703-194]

A fast wavefront reconstructor for the nonlinear curvature wavefront sensor [10703-208]

EMCCD for pyramid wavefront sensor: laboratory characterization [10703-207]

A direct reconstruction technique to retrieve phase in a non-linear curvature wavefront sensor [10703-199]

First on-sky results, performance, and future of the HiCIBaS-LOWFS [10703-196]

Spatial filtering applied to the pyramid WFS: simulations and preliminary results [10703-203]

**POSTER SESSION: PATHFINDERS FOR AO**

Wavefront sensing and adaptive optics for solar prominences [10703-211]
CACAO: a generic low-cost adaptive optics system for small aperture telescopes

CHOUGH: current status and future plans

The adaptive optics lucky imager (AOLI): presentation, commissioning, and AIV innovations

PPPP: an on-sky experiment for zero-cone effect LGS alternative

Simulation of a cascaded adaptive optic system for high contrast imaging

Uplink correction demonstrator: test bench and experimental results

A flexible adaptive optics concept for general purpose high angular resolution science on the DAG 4m telescope

Design and development of IR camera

Developing new adaptive secondary electronics for the MAPS project

ALIOLI: Adaptive and Lucky Imaging Optics Lightweight Instrument

POSTER SESSION: CHARACTERIZATION, MEASUREMENT, AND MODELING OF THE DISTURBANCES FACED BY AO

Limits of turbulence and outer scale profiling with non-Kolmogorov statistics

Deconstructing turbulence and optimizing GLAO using imaka telemetry

Characterization of lemniscate atmospheric aberrations in Gemini Planet Imager data

Improvements to MASS turbulence profile estimation at Paranal

Evaluation of filtering techniques to increase the reliability of weather forecasts for ground-based telescopes

Determination of the residual and static aberrations of an adaptive-optics integral field spectrograph

CATS: an autonomous station for atmospheric turbulence characterization

Towards the forecast of atmospheric parameters and optical turbulence above an astronomical site on 24h time scale

Monitoring the low wind effect on the Starfire Optical Range 3.5-m telescope
The characterization of the Zernike modes at the focal plane for Extremely Large Telescope projects [10703-242]

Vibration model identification using the maximum likelihood method [10703-243]

DAG-TGI: turbulence generator instrument for DAG (Eastern Anatolia Observatory) [10703-246]

Turbulence monitoring at the Plateau de Calern with the GDIMM instrument [10703-247]

First seasonal study of solar seeing and wind speed vertical distribution at Baikal Astrophysical Observatory [10703-248]

Tropospheric seeing effects on site selection and the use of adaptive optics for solar telescopes [10703-251]

POSTER SESSION: WAVEFRONT CORRECTORS

Demonstration of a speckle nulling algorithm and Kalman filter estimator with a fiber injection unit for observing exoplanets with high-dispersion coronagraphy [10703-252]

Cryo micro-deformable mirrors for next generation AO systems [10703-253]

Characterization of ALPAO deformable mirrors for the NAOMI VLTI Auxiliary Telescopes adaptive optics [10703-254]

Wavefront control for minimization of speckle coupling into a fiber injection unit based on the electric field conjugation algorithm [10703-255]

The crystal ball, the spider and other stories: a journey around the test tower of the M4 adaptive mirror [10703-256]

Multi-actuator adaptive lens in astronomy: in lab test results [10703-257]

Testing and characterization of deformable mirrors [10703-258]

GTCAO real time AO closed loop software implementation and initial computer performance analysis [10703-259]

A CVD SiC deformable mirror with monolithic waterline for adaptive optics [10703-260]

Calibration and test procedures for the NFIRAOS deformable mirror prototypes [10703-261]

A possible concept for the day-time calibration and co-phasing of the adaptive M4 mirror at the E-ELT telescope [10703-262]

Design of an active metal mirror for large space telescopes [10703-263]
Non-contact displacement measure method based on eddy current sensors in the large aperture adaptive mirror system [10703-264]
Authors

Numbers in the index correspond to the last two digits of the seven-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first five digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Abdurrahman, Fatima, 0J, 4S, 6D
Abe, L., 57
Abicca, Renata, 11
Absil, Olivier, 14, 1U, 38
Adams, David, 5C
Agapito, Guido, 03, 0E, 11, 12, 22, 41, 43, 46, 4D, 4L, 4P, 5R
Agüero, Juan C., 6R
Ahn, Kyohoon, 77
Akbulak, Ümit Bora, 6T
Akiyama, Masayuki, 0M, 24, 3P
Akulshin, Alexander, 0R
Albert, D., 1Q
Alfred, Dan, 09
Aliverti, Matteo, 11
Allain, Guillaume, 5T
Amico, Paola, 1W
Ammons, S. Mark, 0N, 1N
Anagnos, Theodoros, 5H
Anche, Ramya M., 4K
Andersen, David R., 1K, 3L, 3V, 78
Andersen, Morten, 0P, 3N, 3S
Anderson, Matthew D., 04
Andrade, Denis, 3C
Andrighetto, Mario, 18
Angeli, George Z., 0W
Antoniucci, S., 2U, 2V
Anupama, G. C., 4K
Araujo, Constanza, 0P, 3N, 3T
Arcidiacono, Carmelo, 0B, 0V, 11, 1Y, 2J, 31, 43, 46, 4H, 4I, 4J, 4R, 5L, 5U
Argomedo, Javier, 1G
Aribi, Tarik, 2H
Aristidi, Eric, 6L, 6U
Arsenault, Robin, 02, 1G
Asensio Ramos, Andrés, 4B
Ashby, David S., 0W
Atkinson, Dani, 07
Atwood, Jenny, 3L, 3V
Aucicchio, Natalia, 11
Aydemir, Ömer Faruk, 6T
Baba, Naoshi, 36
Baccicotti, Francesca, 0E
Baffa, Carlo, 0E
Bailey, Vanessa P., 0H, 0K, 56, 6E
Balestra, Andrea, 11
Bao, Hua, 0G
Baranec, Christoph, 07, 0J, 27, 4S
Barbary, Gaëlle, 13
Barbaras, Lisa, 1X, 25
Barette, Rudy, 70
Barr, D., 03
Bartos, R. D., 3B
Baruffolo, Andrea, 03, 0E, 11, 3I, 43
Basden, Alastair G., 0C, 0Q, 16, 18, 19, 1X, 25, 3D, 3F, 4W, 60, 76
Bastard, Arnaud, 2H
Baudouz, Pierre, 13, 1U, 29, 2L, 57, 5D
Bauman, Brian, 1N
Baumeister, Harald, 4R
Beaufort, Emmanuel, 2H
Beaulieu, Mathilde, 1U, 57
Béchet, Clémence, 1B, 1I
Beckers, Jacques Maurice, 6Y
Bellazzini, Michele, 11, 1Y, 3J, 43, 46, 4D, 4H, 4I
Beltramo-Martín, O., 2G
Ben Nejma, Saber, 13
Ben Rahhal, Malak, 6L, 6U
Benetti, S., 28
Bennet, Francis, 0O, 0T, 33, 47
Berger, Jean-Philippe, 71
Bergomi, Maria, 0B, 0E, 0V, 28, 2J, 3Y, 4R, 74
Berkefeld, Thomas, 15, 26, 3A
Bernard, Julian, 18, 1E, 4B
Bernier, Robert, 0W
Berriman, G. B., 1J
Bertram, Thomas, 0B, 14, 4R, 5L
Berwein, Jürgen, 0B, 4R, 5L
Best, W., 1J
Beuzit, Jean-Luc, 1Q, 2A, 3E, 5O, 71
Bharmal, Nazim A., 0Q, 60, 62
Biancat-Marchet, Fabio, 10
Bianco, Andrea, 0E
Biasi, Roberto, 18, 79
Biliotti, V., 03, 3I
Biondi, Federico, 28, 2J, 3Y
Bish, Andrew, 5C
Bishop, Michael W., 1H
Bizenberger, Peter, 0B, 14
Black, Martin, 60
Block, Gary, 1S
Blundell, Mark, 0O
Boccaletti, A., 1Q
Bohn, Chris, 09, 1T
Bolbasova, L. A., 6V
Boldyreva, Ekaterina, 5J
Bonaccini Caia, Domenico, 1X, 25, 3R, 40
Bonafous, Marion, 2L
Noenickx, Jamison, 09
Norris, Barnaby, 1E, 59, 5I
Norton, Andrew P., OK, 5M, 6E
Núñez Cagigal, Miguel, OC, 3F, 4W, 76
Obereder, Andreas, 14, 1D, 44
Oberti, Sylvain, 10, 11, 1G, 1Y, 2D, 4I, 4P
Oesch, Denis W., 1H
Ofek, Eran, 27
Oliker, Michael, 5S
Oliva, Ernesto, 41
Ono, Yoshito H., 0M, 24, 3P
Orban de Xivry, G., 38
Osborn, James, 18, 19, 1X, 25, 2E, 6G
Oscoz, Alejandro, 61, 6A
Otten, Gilles P., 21
Ou, James, 10
Ouellet, Mireille, 5T
Oya, Shin, 0J, 0M, 32, 36
Pagès, Hubert, 2H
Pal, S., 2Z
Palazzari, Paolo, 18
Palmer, David W., 1N
Palomo, Richard, 2H
Pan, Chengliang, 7B
Panas, Robert, 1N
Pannetier, C., 1Q, 2A
Pariani, Giorgio, 11, 45, 73, 79
Park, Byoungyoul, 4G
Pascal, Sandrine, 3X
Patauner, Christian, 18
Pathak, Prashant, 59
Patrón Recio, Jesús, OC, 3F, 4W, 76
Patru, Fabien, 29, 2L
Patt, Mauro, 11, 4H, 4I, 4J
Paul, Jyotirmay, 68
Paul, Marshall, 0H
Paul, Jytotmay, 68
Paix, Paul, 1N
Pedichini, Fernando, OE, 2U, 2V, 4V
Pedroso Bustos, Felipe, OE, 3R
Peleitier, Reynier, 5D
Pérez Garrido, Antonio, 61
Pérez, Gabriel, 0P, 3N, 3T
Perez, Kevin, 09
Perret, Denis, 1B, 19, 4B
Perrot, Clément, 13
Pescoller, Dietrich, 18
Petkovic, Mike, 5C
Pettazzi, Lorenzo, 10, 1G
Pfommer, Thomas, 40
Piazzesi, R., 2U, 2V, 4V
Pinna, Enrico, OE, 0L, 4P, 5R
Piqueras Lopez, Javier, 3X
Pirard, J.-F., 02
Plantet, Cedric, 11, 1Z, 46, 4D, 5R
Podgorski, William, 0X
Podio, Linda, 11
Por, Emiel H., 1T, 1U, 23, 42, 4Z
Portaleuri, Elisa, 0V, 28, 2I, 3Y
Postnikova, M., 57
Poter, Axel, 2L
Pourcelot, R., 5O
Powell, K., 69
Payne, Lisa A., OK, 1N, 56, 6E
Pree, O., 57
Pretet, Damien, 1B
Price, Ian, 0O, 4T, 5Z
Pueyo, Laurent, 1U, 29
Puga Antolin, Marta, OC, 3F, 4W, 76
Puglisí, Alfio, 03, 0E, 0L, 11, 3I, 4D, 4I, 4P, 5R
Punnap, Sujit, 68
Quint, Bruna C., 3C
Quintavalla, M., 74
Quirós-Pacheco, Fernando, 0L, 0W, 22, 4P
Rabou, Patrick, 11, 1Y
Radhakrishnan, Vikram, 42, 4N
Raffetseder, Stefan, 1D
Ragazzoni, Roberto, 0B, 0E, 0V, 11, 1Y, 2B, 2J, 3J, 3Y, 43, 46, 4I, 4J, 4R, 5I, 5J, 74
Ragland, S., 1J, 2G
Rahmer, Gustavo, 0A, 4F
Rajarshi, Chaitanya, 68
Rako, Steve, 0T
Ramaparakash, A. N., 68
Ramlau, Ronny, 44
Rampy, Rachel, 0F, 5P
Rao, Changhui, 0G
Rao, Xuejun, 0G
Rau, C., 3I
Raynoud, Henri-François, 63
Rebolo, Rafael, 61
Redaelli, Edoardo, 11, 4H
Rees, Emily Rose, 0O
Rees, Andrew P., 19, 1X, 25
Reinein, Claudia, 7A
Renaud, Catherine, 6L, 6U
Reyes, C., 2A
Reyes, Javier, 03, 1W
Reynolds, Odell R., 1H
Riccardi, Armando, 03, 0L, 3I, 45, 73, 79
Richards, Kit, 0F, 5P
Riddle, Reed, 07, 27
Ridgway, Stephen T., 04
Rigaut, François, 0M, 0O, 0P, 0T, 24, 33, 3N, 3P, 4O, 4T, 4U, 5Z, 66
Riggs, A. J. Eldorado, 1U
Rimmele, Thomas, 0F, 26, 5W
Ritchie, Ian, 0O
Riva, Marco, 11, 4H, 4J
Roberts, Jennifer E., 1S
Roberts, Lewis C. Jr., 1S, 75
Rochat, Sylvain, 11, 1Y, 71
Rochester, Simon, 0R, 3R
Rodack, Alexander T., 09, 1T, 21, 2N, 4Z, 5A
Rodríguez Ramos, Luis Fernando, OC, 3F, 4B, 4W, 5G, 65, 76
Rodríguez, Joshua, 1S
Rohloff, Ralf-Rainer, 1U
Rosich Minguell, Josefina, OC, 3F, 4W, 76
Ross, Colin, 1K, 4G
xxiii

Proc. of SPIE Vol. 10703 1070301-23
Conference Committee

Symposium Chairs

Allison A. Barto, Ball Aerospace & Technologies Corporation (United States)
Suzanne K. Ramsay, European Southern Observatory (Germany)

Symposium Co-chairs

Satoru Iguchi, National Astronomical Observatory of Japan (Japan)
Alison B. Peck, Gemini Observatory (United States)

Conference Chairs

Laird M. Close, The University of Arizona (United States)
Laura Schreiber, INAF - Osservatorio Astronomico di Bologna (Italy)
Dirk Schmidt, National Solar Observatory (United States)

Conference Program Committee

Christoph Baranec, Institute for Astronomy, University of Hawai‘i (United States)
Thomas Berkefeld, Kiepenheuer-Institut für Sonnenphysik (Germany)
Antonin H. Bouchez, GMTO Corporation (United States)
Brendan P. Bowler, The University of Texas at Austin (United States)
Simone Esposito, INAF - Osservatorio Astrofisico di Arcetri (Italy)
Thierry Fusco, Laboratoire d'Astrophysique de Marseille, ONERA (France)
Yutaka Hayano, TMT-J Project Office, National Astronomical Observatory of Japan (Japan)
Caroline Kulcsar, Institut d'Optique (France)
Anne-Marie Lagrange, Laboratoire d'Astrophysique de l’Observatoire de Grenoble (France)
Miska Le Louarn, European Southern Observatory (Germany)
Jessica R. Lu, University of California, Berkeley (United States)
Pierre-Yves Madec, European Southern Observatory (Germany)
Elena Masciadri, INAF - Osservatorio Astrofisico di Arcetri (Italy)
Dimitri Mawet, California Institute of Technology (United States)
Benoît Neichel, Laboratoire d’Astrophysique de Marseille (France)
Mamadou N'Diaye, Observatoire de la Côte d’Azur (France)
Timothy J. Morris, Durham University (United Kingdom)
Elise Vernet, European Southern Observatory (Germany)
Peter L. Wizinowich, W. M. Keck Observatory (United States)
Session Chairs

1. AO Systems and Status I
   Laird M. Close, The University of Arizona (United States)

2. Astronomy with AO
   Laird M. Close, The University of Arizona (United States)

3. AO Systems and Status II
   Pierre-Yves Madec, European Southern Observatory (Germany)
   Dirk Schmidt, National Solar Observatory (United States)

4. Post-processing AO Data
   Dirk Schmidt, National Solar Observatory (United States)

5. AO Systems and Status III
   Christoph Baranec, Institute for Astronomy, University of Hawai‘i
   (United States)

6. AO Systems and Status IV
   Dirk Schmidt, National Solar Observatory (United States)

7. LGS
   Dirk Schmidt, National Solar Observatory (United States)
   Peter L. Wizinowich, W. M. Keck Observatory (United States)

8. AO for ELTs I
   Timothy J. Morris, Durham University (United Kingdom)

9. AO for ELTs II
   Laura Schreiber, INAF - Osservatorio Astronomico di Bologna (Italy)

10. Advances in AO Control I
    Miska Le Louarn, European Southern Observatory (Germany)

11. Advances in AO Control II
    Yutaka Hayano, TMT-J Project Office, National Astronomical Observatory
    of Japan (Japan)
    Antonin H. Bouchez, GMTO Corporation (United States)

12. Extreme AO
    Mamadou N'Diaye, Observatoire de la Côte d’Azur (France)

13. Wavefront Sensing
    Thomas Berkefeld, Kiepenheuer-Institut für Sonnenphysik (Germany)
    Simone Esposito, INAF - Osservatorio Astrofisico di Arcetri (Italy)
15 Pathfinders for AO
   Dimitri Mawet, Caltech (United States)

16 Characterization, Measurement and Modeling of the Disturbances Faced by AO
   Elena Masciadri, INAF - Osservatorio Astrofisico di Arcetri (Italy)
   Laura Schreiber, INAF - Osservatorio Astronomico di Bologna (Italy)

17 Wavefront Correctors
   Laura Schreiber, INAF - Osservatorio Astronomico di Bologna (Italy)