

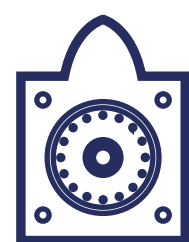
Lucky and Speckle Imaging Projects



Are you an Andor customer using one of our products for lucky or speckle imaging? If so, please get in touch* - we would love to hear more about your research.

NESSI

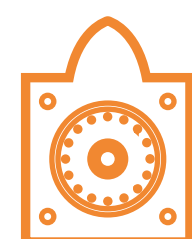
The NASA NSF-Explore Exoplanet Speckle Imager (NESSI)^{1,2} is a dual-channel wide-field imaging and speckle instrument based at the 3.5m WIYN telescope at Kitt Peak National Observatory in Arizona. NESSI is used for exoplanet validation and characterization, supporting space telescope missions from the ground.



iXon Ultra 888

'Alopeke & Zorro

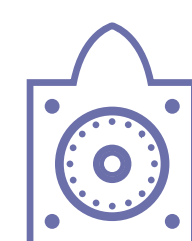
'Alopeke and Zorro are identical instruments^{3,4,5} enabling fast, low-noise and dual-channel speckle as well as wide-field imaging modes. 'Alopeke and Zorro are mounted at Gemini North (Hawaii) and South (Chile) Observatory, respectively.



iXon Ultra 888

FastCam

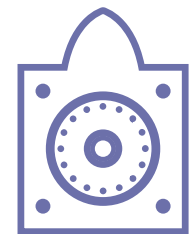
FastCam^{6,7,8} is a lucky imaging instrument developed by the Spanish IAC and the Universidad Politécnica de Cartagena. The aim of FastCam is to provide high spatial resolution images in the optical using a high speed and low noise EMCCD camera.



iXon Ultra DU-897

TCI

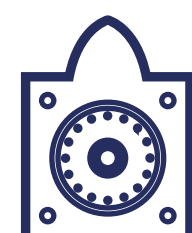
The "Two Color Instrument" (TCI)⁹ used for lucky imaging is located at the Danish 1.54 m telescope at ESO La Silla Observatory (main instrument: DFOSC) and is based on two EMCCDS, which operate in the red and visible part of the spectrum. This dual-channel instrument produced several different scientific discoveries, ranging from exoplanet discoveries through microlensing and the detection of two rings around an asteroid-like object.



iXon+ 897

SONG

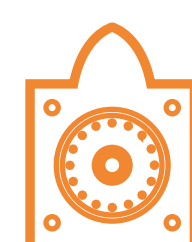
The Stellar Observations Network Group (SONG)^{10,11} is a Danish-led project aiming to design and construct a global network of small 1m-class telescopes. The first prototype telescope¹² was installed and tested at Teide Observatory in Tenerife, Spain ("SONG node Tenerife" or "Hertzsprung SONG telescope"). The science goals of SONG are i) to obtain high-quality stellar oscillation measurements and ii) to study exoplanets using the microlensing method. The latter requires high spatial resolution, which is provided by a two-color lucky imaging instrument using EMCCDs.



iXon Ultra 897

AstraLux Norte & Sur

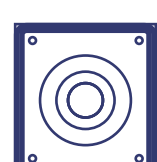
Astralux Norte^{13,14} at the Calar Alto 2.2 m telescope in Spain and Astralux Sur¹⁵ at the 3.5 New Technology Telescope (NTT) at La Silla Observatory in Chile are both lucky imaging cameras based on high speed EMCCDs.



iXon EM+ DU-897 (Sur),
iXon DV887-UVB (Norte)

PlanetCam

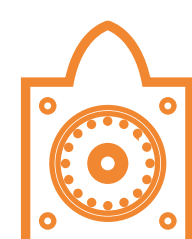
PlanetCam UPV/EHU¹⁶ is an instrument designed to study the atmospheres of solar system planets at high spatial resolution, using the lucky imaging method. It can operate in the visible (380-1000 nm) and the near-infrared (1000-17000 nm) using PlanetCam1 (VIS) and PlanetCam2 (VIS and NIR). For observations in the visible channel, sCMOS cameras are used. Test observations have been performed, for example, at the Calar Alto Observatory (CAHA) in Spain.



Neo sCMOS

QWSSI

The Quad-camera Wavefront Sensing Speckle Imager (QWSSI)^{17,18} is a next-generation speckle imaging instrument currently in development for future use at the 4.3 m Discovery Channel Telescope at Lowell Observatory. QWSSI will allow to observe in six narrow-band channels and it is possible to simultaneously perform wavefront sensing and speckle imaging. This instrument will expand on the work of other speckle imagers, such as NESSI, 'Alopeke, Zorro and DSSI.



iXon Ultra 888

ANDOR
an Oxford Instruments company

References and Further Reading:

- <https://www.noao.edu/noao/staff/everett/nessi/>
- Scott, N. J., Howell, S. B., Horch, E. P. and Everett, M. E., 2018, Publications of the Astronomical Society of the Pacific, 130, 987.
- <https://www.gemini.edu/sciops/instruments/alopeke-zorro/>
- Scott, N. J., Howell, S. B., Horch, E. P., 2016, Proc. SPIE 9907, 99072R
- Scott, N. J., 2018, Proc. SPIE 10701, 1070112
- <http://research.iac.es/proyecto/fastcam//>
- Oscoz, A., Rebolo, R., López, R., Pérez-Garrido, A., et al., 2008, Proc SPIE 7014, 701447.
- <http://research.iac.es/OOCC/wp-content/uploads/interno/manuales/FastCAM/manualfastcam1.pdf>
- Skottfelt, J., Bramich, D. M., Hundertmark, M., Jorgensen, U. G., et al., 2015, A&A 574, A54
- <https://phys.au.dk/song/about-song/>
- Andersen, M. F., Grundahl, F., Christensen-Dalsgaard, J., Frandsen, S., et al., 2014, Revista Mexicana de Astronomia y Astrofisica Serie de Conferencias, Vol 45
- Grundahl, F., Christensen-Dalsgaard, J., Pallé, P. L., Andersen, M. F., et al., 2013, Proc. Of the International Astronomical Union, 9(S301), 36-75
- <http://www2.mpia-hd.mpg.de/ASTRALUX/index.html>
- Hormuth, F., et al., 2008, J. Phys.: Conf. Ser. 131 012051
- http://www2.mpia-hd.mpg.de/ASTRALUX/sur_index.html
- Mendikoa, I., Sánchez-Lavega, A., Pérez-Hoyos, S., Hueso, R., et al., 2016, The Astronomical Society of the Pacific, 128, 961
- van Belle, G., Clark, C., Horch, E., and Trilling, D., 2019, Bulletin of the American Astronomical Society, 51, 6.
- <https://twitter.com/QWSSI1>

This graphic provides a non exhaustive overview of different lucky and speckly imaging projects utilizing Andor products.

*Please contact Ines Juvan-Beaulieu at ijuvan-beaulieu@andor.com