

Kok Leng Yeo

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Employment

Max Planck Institute for Solar System Research, Germany

Postdoc 2014 – present
Postgraduate Fellow 2011 – 2014

DSO National Laboratories, Singapore

Member of Technical Staff 2004 – 2010

Education

Doctor of Natural Sciences

2014

Technical University of Braunschweig, Germany
Thesis: Analysis and Modeling of Solar Irradiance Variations
Advisers: Sami K. Solanki, Natalie A. Krivova, Karl-Heinz Glaßmeier

Master in Science (Physics)

2004

Imperial College London, UK
Thesis: Surface Features on Classical T Tauri Stars
Adviser: Yvonne C. Unruh

Awards

Distinguished Young Scientist Award

2018

Scientific Committee on Solar-Terrestrial Physics

Fred L. Scarf Award for Outstanding PhD Thesis

2016

American Geophysical Union

DSTA Undergraduate Scholarship

1998

Defence Science & Technology Agency, Singapore

Research Interests

Sun-climate relationship, solar irradiance, solar magnetism, solar variability

Research Experience

Max Planck Institute for Solar System Research, Germany

Advisers: Sami K. Solanki and Natalie A. Krivova 2011 – present

- Model solar irradiance variability
- Analyse records and reconstructions of solar irradiance variability
- Analyse relationship between solar magnetism and irradiance variability
- Stray-light characterization of HMI telescope onboard SDO mission

DSO National Laboratories, Singapore

Advisers: Teck Khim Ng, Wee Chin Goh 2004 – 2010

- Develop target recognition algorithms for military surveillance applications

- Doppler imaging of classical T Tauri stars

Publications

18 peer-reviewed publications (10 as first author), 2 invited reviews, 601 citations (as of 19 February 2021 according to [Google Scholar](#))

Bibliography

1. [K. L. Yeo](#), S. K. Solanki, N. A. Krivova, et al. The dimmest state of the Sun. *GRL* **47(19)**, e2020GL090243, 2020. doi: [10.1029/2020GL090243](#)
2. [K. L. Yeo](#), S. K. Solanki, N. A. Krivova. How faculae and network relate to sunspots, and the implications for solar and stellar brightness variations. *A&A* **639**, A139, 2020. doi: [10.1051/0004-6361/202037739](#)
3. R. V. Tagirov, A. I. Shapiro, N. A. Krivova, et al. Readdressing the UV solar variability with SATIRE-S: non-LTE effects. *A&A* **631**, A178, 2019. doi: [10.1051/0004-6361/201935121](#)
4. T. Chatzistergos, I. Ermolli, S. K. Solanki, et al. Recovering the unsigned photospheric magnetic field from Ca II K observations. *A&A* **626**, A114, 2019. doi: [10.1051/0004-6361/201935131](#)
5. [K. L. Yeo](#), N. A. Krivova. Intensity contrast of solar network and faculae. II. Implications for solar irradiance modelling. *A&A* **624**, A135, 2019. doi: [10.1051/0004-6361/201935123](#)
6. J. H. Jungclaus, E. Bard, M. Baroni, et al. The PMIP4 contribution to CMIP6 – Part 3: the Last Millennium, Scientific Objective and Experimental Design for the PMIP4 *past1000* simulations. *Geosci. Model Dev.* **10**, 4005-4033, 2017. doi:[10.5194/gmd-2016-278](#)
7. C. M. Norris, B. Beeck, Y. C. Unruh, et al. Spectral variability of photospheric radiation due to faculae I. The Sun and Sun-like stars. *A&A* **605**, A45, 2017. doi: [10.1051/0004-6361/201629879](#)
8. [K. L. Yeo](#), S. K. Solanki, C. M. Norris, et al. Solar Irradiance Variability is Caused by the Magnetic Activity on the Solar Surface. *PRL* **119**, 091102, 2017. doi:[10.1103/PhysRevLett.119.091102](#)
9. A. I. Shapiro, S. K. Solanki, N. A. Krivova, et al. The nature of solar brightness variations. *Nat. Astron.* **1**, 612-616, 2017. doi:[10.1038/s41550-017-0217-y](#)
10. [K. L. Yeo](#), N. A. Krivova, S. K. Solanki. EMPIRE: A robust empirical reconstruction of solar irradiance variability. *JGR* **122**, 3888-3914, 2017. doi:[10.1002/2016JA023733](#)
11. M. Dasi-Espuig, J. Jiang, N. A. Krivova, et al. Reconstruction of spectral solar irradiance since 1700 from simulated magnetograms. *A&A* **590**, A63, 2016. doi:[10.1051/0004-6361/201527993](#)
12. A. I. Shapiro, S. K. Solanki, N. A. Krivova, et al. Are solar brightness variations faculae- or spot-dominated? *A&A* **589**, A46, 2016. doi:[10.1051/0004-6361/201527527](#)
13. [K. L. Yeo](#), A. I. Shapiro, N. A. Krivova, et al. Modelling solar and stellar brightness variabilities. *ASP Conf. Ser.* **504**, 273, 2016. **(Invited review)**
14. [K. L. Yeo](#), W. T. Ball, N. A. Krivova, et al. UV solar irradiance in observations and the NRLSSI and SATIRE-S models. *JGR (Space Phys.)* **120**, 6055-6070, 2015. doi:[10.1002/2015JA021277](#)
15. [K. L. Yeo](#), N. A. Krivova, S. K. Solanki. Solar Cycle Variation in Solar Irradiance. *Space Sci. Rev.* **186(1)**, 137-167, 2014. doi:[10.1007/s11214-014-0061-7](#) **(Invited review)**
16. G. Thuillier, G. Schmidtke, C. Erhardt, et al. Solar Spectral Irradiance Variability in November/December 2012: Comparison of Observations by Instruments on the International Space Station and Models. *Sol. Phys.* **289**, 4433-4452, 2014. doi:[10.1007/s11207-014-0588-5](#)

17. [K. L. Yeo](#), N. A. Krivova, S. K. Solanki, et al. Reconstruction of total and spectral solar irradiance from 1974 to 2013 based on KPVT, SoHO/MDI and SDO/HMI observations. *A&A* **570**, A85, 2014. doi:[10.1051/0004-6361/201423628](https://doi.org/10.1051/0004-6361/201423628)
18. [K. L. Yeo](#), A. Feller, S. K. Solanki, et al. Point spread function of SDO/HMI and the effects of stray light correction on the apparent properties of solar surface phenomena. *A&A* **561**, A22, 2014. doi:[10.1051/0004-6361/201322502](https://doi.org/10.1051/0004-6361/201322502)
19. [K. L. Yeo](#), S. K. Solanki, N. A. Krivova. Intensity contrast of network and faculae. *A&A* **550**, A95, 2013. doi:[10.1051/0004-6361/201220682](https://doi.org/10.1051/0004-6361/201220682)

Invited Talks

1. Solar irradiance variability and surface magnetism. 2018 SDO Science Workshop, Ghent, Belgium, 29 October to 2 November 2018.
2. Measurements and models of total and spectral solar irradiance variability in the satellite-era. SCOSTEP's 14th Quadrennial Solar-Terrestrial Physics Symposium, Toronto, Canada, 9 to 13 July 2018.
3. Solar radiative forcing. IAPSO-IAMAS-IAGA Joint Assembly, Cape Town, South Africa, 28 August to 1 September 2017.
4. UV SSI variability – Why do measurements and models not agree? 6th International HEPPA-SOLARIS Workshop, Helsinki, Finland, 13 to 17 June 2016.
5. SATIRE-S reconstruction of TSI and SSI since 1974. 2015 Sun-Climate Symposium, Savannah, Georgia, USA, 10 to 13 November 2015.
6. Solar magnetic activity and solar irradiance variability since 1978. 2nd SOLARNET Meeting, Palermo, Italy, 2 to 5 Feb 2015.
7. Solar irradiance variability and the Earth's climate. SCOSTEP's 13th Quadrennial Solar-Terrestrial Physics Symposium, Xi'an, China, 12 to 17 Oct 2014.
8. Reconstruction of TSI and SSI in the satellite era. EGU General Assembly 2014, Vienna, Austria, 27 April to 2 May 2014.
9. Solar irradiance and the solar activity cycle. ISSI workshop 'The Solar Activity Cycle: Physical Causes and Consequences', Bern, Switzerland, 11 to 15 Nov 2013.

Collaborations

1. Charlotte Norris, Yvonne C. Unruh (Imperial College London, UK)
Matthias Rempel (HAO-NCAR, USA)
Modelling solar irradiance variability with 3D radiative MHD simulations
2. Odele Coddington, Greg Kopp (LASP, USA)
Understanding the discrepancies between empirical and semi-empirical models of solar irradiance variability
3. Johann Jungclaus, Hauke Schmidt (MPI for Meteorology, Germany)
Solar forcing for the Paleoclimate Modeling Intercomparison Project (PMIP)
4. Bernd Funke (IAA-CSIC, Spain)
Katja Matthes (GEOMAR-Helmholtz Centre for Ocean Research Kiel, Germany)
Solar forcing for the Coupled Model Intercomparison Projects Phase 6 (CMIP6)
5. William T. Ball (PMOD/WRC, Switzerland)
Jeff Morrill (NRL, USA)
Review of records and reconstructions of ultraviolet solar irradiance
6. Gérard Thuillier (LATMOS-CNRS, France)
Model verification of ISS solar irradiance measurements
7. Sebastien Couvidat (Stanford University, USA)
Stray-light characterization of HMI telescope onboard SDO mission

Supervision of Students

Master Thesis

1. Anthony Ioan 2017 – 2019
Modelling solar irradiance variability using GONG solar magnetograms

Bachelor Thesis

2. Robert Willer 2016 – 2017
Evolution of solar active regions

Internship

3. Nandini Hazra 2016
Active region tracking
4. Ragadeepika Pucha 2015
Solar meridional flow
5. Mia Lovric 2014 – 2015
Effect of spatial resolution on solar magnetograms.
6. Kodumuru Vamsikrishna 2014
Variation in the solar magnetic network over the activity cycle

Other Scientific Activities

- Referee for international scientific journals: Astronomical Journal, Astrophysical Journal, Astrophysics and Space Science, Geophysical Research Letters, Journal of Atmospheric and Solar-Terrestrial Physics, Journal of Space Weather and Space Climate, Journal of the Korean Astronomical Society, New Astronomy, Research in Astronomy and Astrophysics, Solar Physics, Sun and Geosphere
- Participation in national and international Sun-climate projects: CMIP6, HEPPA-SOLARIS, ISSI Team 373, PMIP, ROMIC