

# **Programme**

## **Helicity Thinkshop 3**

**at Institute of Industrial Science (IIS), University of Tokyo**

**19-24 November 2017**

Sunday, 19 November 2017

***Reception***

1800-2100 Reception

at Room An301-302 at Institute of Industrial Science (IIS), University of Tokyo

<http://www.iis.u-tokyo.ac.jp/en/access/>

Monday, 20 November 2017

***Helicity fundamentals***

0950-1000 Opening

***Session 1-1***

(Chair: Manolis Georgoulis)

1000-1030

**Absolute measures of helicity**

Mitchell Berger

University of Exeter

1030-1100

**Magnetic helicity as a predictor of the solar cycle**

Gareth Hawkes and Mitchell Berger

University of Exeter

1100-1130

**Quadratic helicity in MHD**

Peter Akhmet'ev [1] and Simon Candelaresi [2]

[1] IZMIRAN, Russian Academy of Sciences, [2] University of Dundee

1130-1255 Lunch Break

1255-1300 Director General of IIS

***Session 1-2***

(Chair: Mitchell Berger)

1300-1330

**Field line helicity as a tool for coronal physics**

Anthony Yeates [1], Gunnar Hornig [2], and M. H. Page

[1] Durham University, [2] University of Dundee

1330-1400

**Measuring changing field connectivity of interacting flux ropes**

Christopher Prior and Anthony Yeates  
Durham University

1400-1430

**Topology conserving magnetic field evolution**

Simon Candelaresi [1], David Pontin [1], Gunnar Hornig [1], Christopher Berg-Smiet, and Dirk Bouwmeester  
[1] University of Dundee

1430-1500 Tea Break

***Session 1-3***

(Chair: Nobumitsu Yokoi)

1500-1530

**Dynamo theory and Wolf number prediction**

Nathan Kleeorin  
Ben-Gurion University of the Negev

1530-1600

**Inverse cascades in helically magnetized turbulence**

Peter Frick, Rodion Stepanov, and Irina Mizeva  
Institute of Continuous Media Mechanics, Russian Academy of Sciences

1600-1630

**On the inverse transfer of helical and non-helical magnetic energy in a decaying magnetohydrodynamic turbulence**

Kiwan Park  
Institute of Theoretical Physics at University of Heidelberg

Tuesday, 21 November, 2017

***Helicity and Turbulence in Solar and Stellar Dynamos***

***Session 2-1***

(Chair: Nathan Kleeorin)

1000-1030

**Effect of Prandtl number on stratified convection with and without rotation**

Yuto Bekki [1], Hideyuki Hotta [2], and Takaaki Yokoyama [1]

[1] Department of Earth and Planetary Science, University of Tokyo, [2] Chiba University

1030-1100

**Mechanism of mean flow generation in rotating turbulence and its relation to inertial wave**

Kazuhiro Inagaki, Nobumitsu Yokoi, Fujihiro Hamba

Institute of Industrial Science (IIS), University of Tokyo

1100-1130 Tea Break

1130-1200

**Magnetic helicity and small-scale dynamo in a mirror-asymmetric flow**

Dmitry Sokoloff [1,2] and Egor Yushkov [1]

[1] Moscow State University, [2] IZMIRAN, Russian Academy of Sciences

1200-1230

**Determine dynamo mechanisms and the role of helicity in compressible convective dynamo simulations of solar-like stars**

Jörn Warnecke

Max Planck Institute for Solar System Science (MPS)

1230-1400 Lunch Break

***Session 2-2***

(Chair: Kirill Kuzanyan)

1400-1430

**Generation of large-scale magnetic field in convective full-sphere cross-helicity dynamo**

Valery Pipin [1] and Nobumitsu Yokoi [2]

[1] Institute solar-terrestrial physics, Russian Academy of Sciences, [2] Institute of Industrial Science (IIS), University of Tokyo

1430-1500 Short Presentation of Posters

1430-1435

**Some general results on relative magnetic helicity and field line helicity**

Jean-Jacques Aly

CEA

1435-1440

**Development of a helium imaging polarimeter**

Masaaki Hagino, Yoshinori Suematsu, and Kazuya Shinoda  
National Astronomical Observatory of Japan (NAOJ)

1440-1445

**A novel approach to measure solar magnetic helicity: an application using the SOLIS data**

Nishant Singh  
Max Planck Institute for Solar System Research (MPS)

1445-1450

**The extended linear correlation between the H $\alpha$  and the soft X-ray emissions in the solar and stellar flares**

Hiroki Kawai [1], Yohko Tsuboi [1], Ryo Iizuka [2], Sojiro Yamada [1], Satoru Katsuda [1], Ryo Sasaki [1], Yumiko Nakamura [1], and Ryuto Sugita [1]  
[1] Department of Physics, Chuo University, [2] Institute of Space and Astronautical Science (ISAS)/ Japan Aerospace Exploration Agency (JAXA)

1450-1455

**The source regions of possible super-events: Context matters**

KD Leka, Sung-Hong Park, and Kanya Kusano  
Institute for Solar-Terrestrial Environmental Research (ISEE), Nagoya University

1455-1500

**Investigating the coronal magnetic field from the type-II radio burst event on 2 May 2013**

Mohamed Nedal, Ayman Mahrous, and Mohamed Yousef  
Space Weather Monitoring Center, Helwan University

1500-1600 Tea Break and Poster Session

**Session 2-3**

(Chair: Dmitry Sokoloff)

1600-1630

**Magnetic helicity in turbulent reconnection**

Fabien Widmer [1], Nobumitsu Yokoi [2], Jörg Büchner [3], Patricio Munoz [3], and Xiaowei Zhou [4]  
[1] CEA, [2] Institute of Industrial Science (IIS), University of Tokyo, [3] Max Planck Institute for Solar System Research, [4] Key Laboratory of Dark Matter and Space Astronomy, Purple Mountain Observatory, Chinese Academy of Sciences

1630-1700

**Dynamic balance in turbulent transport: Helicity and density-variance effects**

Nobumitsu Yokoi  
Institute of Industrial Science (IIS), University of Tokyo

Wednesday, 22 November 2017

***Helicity in the Solar Atmosphere***

***Session 3-1***

(Chair: Takashi Sakurai)

0930-1000

**Magnetic helicity in the solar atmosphere: Much gained, still a lot to learn**

Manolis Georgoulis

Research Center for Astronomy and Applied Mathematics (RCAAM) of the Academy of Athens

1000-1030

**Prediction of solar eruptions using the structural analysis of magnetic twist**

Kanya Kusano, Tomoya Iju, Muhamad Johan, Satoshi Inoue, Naoyuki Ishiguro, Yuki Asahi, Yuta Mizuno, KD Leka, and Sung-Hong Park

Institute for Space-Earth Environmental Research (ISEE), Nagoya University

1030-1100 Tea Break

1100-1130

**Magnetic field and helicity of solar active regions from observations**

Hongqi Zhang

National Astronomical Observatories, Chinese Academy of Sciences

1130-1200

**Current helicity of large scale photospheric magnetic fields during solar cycle 24**

Alexei Pevtsov [1,2] and Ilpo Virtanen [2]

[1] National Solar Observatory, [2] University of Oulu

1200-1330 Lunch Break

***Session 3-2***

(Chair: Hongqi Zhang)

1330-1400

**Two-scale analysis of solar magnetic helicity**

Axel Brandenburg [1,2]

[1] University of Colorado, [2] Nordic Institute for Theoretical Physics (NORDITA)

1400-1430

**The Rossby number dependence of large-scale dynamo in solar-like strongly-stratified convection**

Youhei Masada

Aichi University of Education

1430-1500

**Observational studies of current helicity and relevant quantities of subsurface flow**

Yu Gao

National Astronomical Observatories, Chinese Academy of Sciences

1500-1530 Tea Break

**Session 3-3**

(Chair: Alexei Pevtsov)

1530-1600

**Tilt of bipolar active regions and formation of helicity from twisted mean magnetic fields**

Kirill Kuzanyan [1], Nathan Kleeorin [2], Igor Rogachevskii [2], Dmitry Sokoloff [3,1], Andrey Tlatov, and K. Tlatova

[1] IZMIRAN, Russian Academy of Sciences, [2] Ben-Gurion University of Geneva, [3] Moscow State University

1600-1630

**Wavelet analysis of magnetic energy and current helicity in active region of the sunspot**

Rodion Stepanov [1] and Kirill Kuzanyan [2]

[1] Institute of Continuous Media Mechanics, Russian Academy of Sciences, [2] IZMIRAN, Russian Academy of Sciences

1630-1730 Discussion

1930-2130 Workshop Banquet

at Insho-tei at Ueno Park

<http://www.innsyoutei.jp>

<https://www.google.co.jp/maps/place/Innsyoutei/@35.7139718,139.7708949,16z/data=!4m5!3m4!1s0x60188c2781e78675:0x7f87b38923b6b58e!8m2!3d35.7138872!4d139.7726349?hl=en>

Thursday, 23 November 2017

***Helicity in the Solar and Stellar Systems***

***Session 4-1***

(Chair: Jörn Warnecke)

0930-1000

**Electromotive force measurements in interplanetary space**

Yasuhito Narita

Space Research Institute, Austrian Academy of Sciences

1000-1030

**Helicity and plasma beta models from the solar atmosphere into interplanetary space**

Philippe-A. Bourdin

Space Research Institute, Austrian Academy of Sciences

1030-1100 Tea Break

1100-1130

**Characteristics of magnetic helicity injection in the active region photosphere**

Sung-Hong Park [1], KD Leka [1,2], Kanya Kusano [1]

[1] Institute for Space-Earth Environmental Research (ISEE), Nagoya University, [2] North West Research Associates (NWRA)

1130-1200

**Solar magnetic field evolution under the restriction of helicity conservation**

Shangbin Yang

National Astronomical Observatories, Chinese Academy of Sciences

1200-1330 Lunch Break

***Session 4-2***

(Chair: KD Leka)

1330-1400

**Chirality of the magnetic field in solar filaments**

Yoichiro Hanaoka and Takashi Sakurai

National Astronomical Observatory of Japan (NAOJ)

1400-1430

**Reversed rotation of the well-developed sunspot associated with an X-class flare**

Takahiro Hasegawa [1,2], Toshifumi Shimizu [2,1]

[1] University of Tokyo, [2] Institute of Space and Astronautical Science (ISAS)/JAXA



1430-1500

**Magnetic helicity and the eruptive nature of solar active regions**

Vema Reddy Panditi

Indian Institute of Astrophysics

1500-1530 Tea Break

**Session 4-3**

(Chair: Axel Brandenburg)

1530-1600

**A correlation on hyper X-ray stellar flares between the quiescent luminosity and the largest flare energy detected with MAXI**

Ryo Sasaki, Yohko Tsuboi, Satoru Katsuda, Ken Yabuki, Yumiko, Nakamura, Yasuharu Sugawara, Masaru Matsuoka, and MAXI team

Department of Physics, Chuo University

1600-1630

**Observation and modeling of flare-productive active regions of the sun**

Shin Toriumi

National Astronomical Observatory of Japan (NAOJ)

1630-1730 Summary Discussion

Closing

Friday, 24 November 2017

**NAOJ Tour**

0900-1030 Guided Tour to National Astronomical Observatory of Japan (NAOJ)

<https://www.nao.ac.jp/en/access/mitaka/access.html>

1030-1200 Visit to Solar Telescope at NAOJ

1200-1330 Lunch Break

1330-1500 Free Discussion

1500-1700 Summary Meeting of Organizing Committee