

“Solar and stellar dynamos: a new era”

ISSI Workshop Program, 13 – 17 June 2022

Monday, 13 June 2022		
<i>Notice: All presentations include 5 min question time</i>		
08:30-09:00	Registration in ISSI Hallerstrasse 6, 1 st floor	
09:00-09:20	Welcome and introduction to ISSI and workshop	Maurizio Falanga
	Introduction	Chair: Manfred Schüssler
09:20-09:55	Dynamos in astrophysics	Dmitry Sokoloff
09:55-10:30	Evolution of solar & stellar dynamo models	Paul Charbonneau
10:30-11:00	<i>Coffee Break</i>	
	1. Basic observations: Sun & stars	Chair: Paul Charbonneau
11:00-11:35	Solar cycle: basic observations	Lisa Upton
11:35-12:10	Long-term variability of the solar cycle	Ilya Usoskin
12:10-12:30	Is the solar cycle externally synchronized?	Eckhard Weisshaar
12:30-14:00	<i>Lunch</i>	
		Chair: Jennifer van Saders
14:00-14:20	Sunspots, bipolar regions, and magnetograms: A new generation of multi-cycle surveys	Andrés Muñoz-Jaramillo
14:20-14:40	Delta-spots and activity nests of solar cycle 24	Aimee Norton
14:40-15:15	Observation of stellar activity	Ansgar Reiners
15:15-15:35	New and old benchmarks for stellar magnetic activity	Brett Morris
15:35-16:05	<i>Coffee Break</i>	
		Chair: Sacha Brun
16:05-16:40	Magnetic cycles on stars	Sandra Jeffers
16:40-17:00	Asteroseismic insights into magnetic activity (cycles)	René Kiefer
17:00-17:35	Stellar evolution as a window into the magnetic lives of Sun-like stars	Jennifer van Saders
17:35-17:55	Stellar constraints on dynamo evolution	Travis Metcalfe
18:00	<i>Welcome reception</i>	

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Tuesday, 14 June 2022		
	2. Mechanisms and processes	Chair: Aimee Norton
09:00-09:35	Solar convection – where are we?	Mark Rast
09:35-09:55	Measurement of solar flows over two solar cycles	Lisa Upton
09:55-10:30	Constraints from helioseismology	Laurent Gizon
10:30-11:00	<i>Coffee break</i>	
		Chair: Mark Rast
11:00-11:35	Theory of meridional flow and differential rotation	Leonid Kitchatinov
11:35-12:10	Tachocline dynamics and overshooting in solar-like stars	Sacha Brun
12:10-12:45	Small-scale dynamos: Fundamental processes and implications for stellar convection and magnetism	Matthias Rempel
12:45-14:30	<i>Lunch</i>	
		Chair: Matthias Rempel
14:30-14:50	Small-scale dynamo in cool main-sequence stars: stratification, convection, field structure, and intensity	Tanayveer Bhatia
14:50-15:25	Turbulent processes: overview and mean-field theory	Axel Brandenburg
15:25-16:00	Simulations of turbulent processes	Petri Käpylä
16:00-16:30	<i>Coffee break</i>	
		Chair: Hannah Schunker
16:30-17:05	Global MHD of the tachocline instabilities and implications for the spatio-temporal distribution of active regions	Mausumi Dikpati
17:05-17:25	Global MHD of extended cycle's double magnetic bands: their cross-equatorial interactions	Bernadette Belucz
17:25-18:00	The formation and evolution of magnetic structures in the convection zone	Maria Weber

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Wednesday, 15 June 2022		
		Chair: Maria Weber
09:00-09:35	Flux emergence: observation vs. simulation	Hannah Schunker
09:35-09:55	Magnetic flux emergence in the solar convection zone: 3D global simulations and prescriptions for Babcock-Leighton dynamo models	Laurène Jouve
09:55-10:30	Surface flux transport	Anthony Yeates
10:30-10:50	Data-Driven surface flux transport models: Implications for the solar interior and space weather	Mark Cheung
10:50-11:20	<i>Coffee break</i>	
		Chair: Kristof Petrovay
	3. Models	
11:20-11:55	Mean-field models of the solar dynamo	Valery Pipin
11:55-12:30	Flux transport dynamo models of solar-stellar magnetic cycles	Dibyendu Nandi
12:30-13:05	The Babcock-Leighton dynamo	Robert Cameron
13:05	<i>Lunch</i>	
Afternoon	Free time to visit the attractions of Bern ISSI facilities are available for small group discussions	
19:30	<i>Workshop dinner at restaurant “Kornhauskeller”</i>	

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Thursday, 16 June 2022		
		Chair: Robert Cameron
09:00-09:35	The effect meridional circulation variations on the solar dynamo	Arnab Choudhuri
09:35-10:10	Models for long-term cycle variability	Bidya Karak
10:10-10:30	Nonlinear feedback vs. stochastic effects on solar cycle amplitude variations	Kristof Petrovay
10:30-11:00	<i>Coffee break</i>	
		Chair: Dibyendu Nandi
11:00-11:20	Exploring magnetic activity, cycle-period and parity of solar-type stars using a Babcock-Leighton dynamo model	Gopal Hazra
11:20-11:40	Prediction of the sunspot cycle using an observationally-constrained dynamo model	Prantika Bhowmik
11:40-12:00	Toroidal flux loss due to flux emergence explains why all solar cycles decline in the same way	Akash Biswas
12:00-12:20	The role of the corona for the dynamo	Detlef Elstner
12:20-12:40	Magnetic flux emergence and variability in solar-type stars	Emre Işık
12:40-14:00	<i>Lunch</i>	
		Chair: Hideyuki Hotta
14:00-14:20	Magnetic backreaction in a Babcock-Leighton dynamo model and systematic errors on cycle prediction	Alexandre Lemerle
	4. Simulations	
14:20-14:55	3D-MHD simulations of the solar dynamo	Jörn Warnecke
14:55-15:30	3D turbulent models of solar-like magnetic cycles	Antoine Strugarek
15:30-15:50	Numerical studies of inertial modes in the Sun	Yuto Bekki
15:50-16:10	The long-term evolution of active region helicity and its relationship to the surface and subsurface dynamos	Yi-Ming Wang
16:10-16:40	<i>Coffee break</i>	
	ISSI Book	
16:40	Discussion book (authors, book plans, actions, schedule)	M. Falanga & M. Schüssler

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Friday, 17 June 2022		
		Chair: Petri Käpylä
09:00-09:35	3D-MHD simulations of stellar dynamos	Matthew Browning
09:35-09:55	Solar/stellar dynamo: connection between MHD simulations and mean-field models	Yohei Masada
09:55-10:30	Global MHD modeling of stellar dynamos: the role of tachocline instabilities	Gustavo Guerrero
10:30-10:50	Impact of metallicity in current simulations of solar-type stars dynamo	Quentin Noraz
10:50-11:20	<i>Coffee break</i>	
		Chair: Axel Brandenburg
11:20-11:55	Future prospects	Hideyuki Hotta
11:55-12:30	Concluding remarks	Manfred Schüssler
12:30	End of Workshop	