

2016 UK MHD –

National Conference on Geophysical, Astrophysical and Industrial Magnetohydrodynamics

Glasgow, 12 and 13 May 2016



University of Glasgow | School of Mathematics & Statistics

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David MacTaggart
David R. Fearn

— Programme —

A long version of this programme including abstracts is available online at <http://www.gla.ac.uk/schools/mathematicsstatistics/events/conferences/ukmhd2016>.

— Thursday, 2016-05-12 —

■ Welcome and Registration

- 9:00 – 10:25 Arrival, registration, set-up of posters. Refreshments available.
10:25 – 10:30 PROF ADRIAN BOWMAN
Head of School Welcome message

■ Invited Lecture

Chairperson: Keke Zhang

- 10:30 – 11:10 PHILIPPA BROWNING
Relaxation modelling and MHD simulations of energy release in kink-unstable coronal loops

■ Session 1: Solar Applications I

Chairperson: Alan Hood

- 11:10 – 11:25 TONY ARBER, *C. Brady*
Simulations of Alfvén wave driving of the solar chromosphere - efficient heating and spicule launching.
- 11:25 – 11:40 BEN SNOW, *G. Botha, J. McLaughlin, A. Hillier*
Onset of 2D reconnection in the solar photosphere, chromosphere and corona
- 11:40 – 11:55 ANDREW HILLIER, *Shinsuke Takasao, Naoki Nakamura*
Investigating slow-mode MHD shocks in a partially ionised plasma
- 11:55 – 12:10 JAMES THRELFALL, *J. E. H. Stevenson, C. E. Parnell, T. Neukirch*
Particle dynamics at reconnecting magnetic separators
- 12:10 – 12:25 NIC BIAN, *E. Kontar, J. Watters, G. Emslie*
Turbulent reduction of parallel transport in magnetized plasmas and anomalous cooling of coronal loops

■ Lunch Break

- 12:25 – 14:00 Lunch is provided at “One A The Square”. The restaurant is located at the North-West corner of the Main University Building. Lunch vouchers enclosed in delegates’ conference wallets.

■ Session 2: Solar Applications II

Chairperson: David Hughes

- 14:00 – 14:15 DAVID PONTIN, *G. Hornig, S. Candelaresi*
Braided magnetic fields: equilibria, relaxation, and heating
- 14:15 – 14:30 GUNNAR HORNIG, *A.R. Yeates, A. Russell*
Field Line Helicity

14:30 – 14:45 ANTHONY YEATES, *G. Hornig*
The Global Distribution of Magnetic Helicity in the Sun's Corona

■ Posters and Afternoon Coffee Break

Chairperson: David MacTaggart

14:45 – 15:50 Posters and Coffee Break
(Posters will remain on display in the Maths and Stats Common Room on both days.)

- Poster* ADAM CHILD, *R. Hollerbach, B. Marston, S. Tobias*
Generalised quasi-linear approximation of the HMRI
- Poster* LARS MEJNERTSEN, *J. Eastwood, J. Chittenden, A. Masters*
Global MHD Simulations of Planetary Magnetospheres
- Poster* TIM WHITBREAD, *A. Yeates, A. Munoz-Jaramillo*
Parameter Optimization for Surface Flux Transport Models
- Poster* GRACE COX, *P. Livermore, J. Mound*
The observational signature of modelled torsional waves and comparison to geomagnetic jerks
- Poster* ALEXEI BORISSOV, *T. Neukirch, J. Threlfall*
Examining Particle Behaviour in an Analytical Model of Collapsing Magnetic Traps with a Braking Plasma Jet
- Poster* CETIN CAN EVIRGEN, *A. Shukurov, F. Gent, A. Fletcher, P. Bushby*
Statistical geometry of the magnetic field in the multi-phase, turbulent interstellar medium
- Poster* AGNIESKZA HUDOBA
Instabilities in buoyant convective flows
- Poster* OLIVER BARDSLEY
Rotating-MHD waves from buoyant blobs in the core of the Earth

■ Session 3: Solar Applications III

Chairperson: Andrew Soward

- 15:55 – 16:10 CHRIS LOWDER, *A.R. Yeates*
Magnetic Flux Rope Identification and Characterization from Observationally-Driven Solar Coronal Models
- 16:10 – 16:25 ALAN HOOD, *C. Johnston, I. De Moortel, P. Cargill*
A new approach to chromospheric evaporation due to enhanced coronal heating
- 16:25 – 16:40 DALI KONG, *K. Zhang, G. Schubert*
Using Jupiter's gravitational field to probe the Jovian convective dynamo
- 16:40 – 16:55 VERONIKA WITZKE, *L. J. Silvers, B. Favier*
Dynamo action in turbulent fully compressible shear flows
- 16:55 – 17:10 JONATHAN HODGSON, *T. Neukirch*
A combined theory for symmetric MHD equilibria with anisotropic pressure and magnetic shear

■ Conference Dinner at Balbir's

- 19:00 – 19:30 Drinks reception at Balbir's Indian restaurant in Glasgow's West End.
19:30 – Seated for dinner.

— Friday, 2016-05-13 —

■ Invited Lecture

Chairperson: David Fearn

- 9:00 – 9:40 PETER A DAVIDSON
How do planetary dynamos work?

■ Session 4: Geophysical and Planetary Applications

Chairperson: Chris Jones

- 9:40 – 9:55 KIRILL KUZANYAN, *A.G. Tlatov, V.V. Vasileva*
New characteristic of solar cyclicity by long term series of filament data

- 9:55 – 10:10 LONG CHEN, *W. Herreman, K. Li, A. Jackson*
The optimized kinematic dynamo in a sphere
- 10:10 – 10:25 JOSHUA KIRK, *D. Hughes, C. Jones*
Saturn's axisymmetric field: A low Rm nonlinear analysis
- 10:25 – 10:40 XIOMARA MARQUEZ, *C. Jones, S. Tobias*
Rotating Magnetic Shallow Water Waves in a Sphere

■ Morning Coffee Break

10:40 – 11:10

■ Session 5: Astrophysical Applications

Chairperson: Gunnar Hornig

- 11:10 – 11:25 KONSTANTINOS GOURGOULIATOS, *R. Hollerbach, T. Wood*
3-D Simulations of Electron-MHD in magnetar crusts
- 11:25 – 11:40 MAIRI ELISE MCKAY, *M. Linkmann, A. Berera*
Helical mode interactions and spectral transfer processes in magnetohydrodynamic turbulence
- 11:40 – 11:55 ANGELA BUSSE *J. Pratt, W.-C. Müller*
Statistical properties of tracer trajectories in homogeneous MHD turbulence
- 11:55 – 12:10 AMIT SETA, *P. Bushby, A. Shukurov, T. Wood*
Cosmic Ray Propagation in Intermittent Magnetic Fields
- 12:10 – 12:25 JAMES HOLLINS, *A. Fletcher, G. Sarson, A. Shukurov, F. Gent*
Space- and time-correlations in the supernova driven interstellar medium

■ Lunch Break

12:10 – 14:00 Lunch is provided at “One A The Square”. The restaurant is located at the North-West corner of the Main University Building. Lunch vouchers enclosed in delegates' conference wallets.

■ Session 6: Models and Methods

Chairperson: Tony Arber

- 14:00 – 14:15 LAURA CURRIE, *Matthew Browning*
Dissipation in convective flows
- 14:15 – 14:30 VALERIA SHUMAYLOVA, *M.R.E. Proctor*
Kinematic dynamo action: Transition from large- to small-scale
- 14:30 – 14:45 WAYNE ARTER
Simple Model for Reconnection
- 14:45 – 15:00 FIONA WILSON, *T. Neukirch*
Three-Dimensional Analytical Magnetohydrostatic Equilibria of Rigidly Rotating Magnetospheres in Cylindrical Geometry
- 15:00 – 15:15 MAT HUNT, *J. Sivaloganathan*
A New Formulation of Incompressible Magnetohydrodynamics and its Application to Jets
- 15:15 – 15:30 YUE-KIN TSANG, *J. Mason*
Effects of a guided-field on particle diffusion in magnetohydrodynamic turbulence

■ End of Meeting Coffee Break

15:30 – 16:00

— Withdrawn Contributions—

- Withdrawn talk MARION WEINZIERL, *A.R. Yeates, D.H. Mackay, C.J. Henney, C.N. Arge*
A New Technique for the Photospheric Driving of Non-Potential Solar Coronal Magnetic Field Simulations
- Withdrawn talk MOULOUD KESSAR, *F. Plunian, R. Stepanov, G. Balarac*
Non-Kolmogorov cascade of helicity driven turbulence

— List of Participants —

1. Peter Davidson, University of Cambridge
2. Philippa Browning, University of Manchester
3. Marion Weinzierl, Durham University
4. Kumiko Hori, University of Leeds
5. James Threlfall, University of St Andrews
6. Anthony Yeates, Durham University
7. Valeria Shumaylova, University of Cambridge
8. Tony Arber, University of Warwick
9. Yue-Kin Tsang, University of Exeter
10. Laura Currie, University of Exeter
11. Tim Whitbread, Durham University
12. Xiomara Márquez, University of Leeds
13. Daniel Miller, University of Exeter
14. Jamie Quinn, University of Glasgow
15. Adam Child, University of Leeds
16. David Hughes, University of Leeds
17. Joshua Kirk, University of Leeds
18. Keke Zhang, University of Exeter
19. Gert Botha, Northumbria University
20. Lars Mejnertsen, Imperial College London
21. Grace Cox, University of Liverpool
22. Chris Jones, University of Leeds
23. Dali Kong, University of Exeter
24. Mouloud Kessar, University of Leeds
25. Robert Teed, University of Cambridge
26. Joanne Mason, University of Exeter
27. Long Chen, ETH Zurich
28. Daniela Weston, University of Leeds
29. Alexei Borissov, University of St Andrews
30. Ben Snow, Northumbria University
31. Andrew Hillier, University of Cambridge
32. Wayne Arter, Culham Centre for Fusion Energy
33. Hope Thackray, University of Sheffield
34. Mairi McKay, University of Edinburgh
35. Agnieszka Hudoba, Coventry University
36. Steven Tobias, University of Leeds
37. Chris Lowder, Durham University
38. Amit Seta, Newcastle University
39. Cetin Evirgen, Newcastle University
40. Nicolas Bian, University of Glasgow
41. Fiona Wilson, University of St Andrews
42. Jonathan Hodgson, University of St Andrews
43. Veronika Witzke, City University London
44. Angela Busse, University of Glasgow
45. Oliver Bardsley, University of Cambridge
46. Karen Meyer, Abertay University
47. James Hollins, Newcastle University
48. Abrar Ali, City University London
49. David Pontin, University of Dundee
50. Konstantinos Gourgouliatos, University of Leeds
51. Richard Ho, University of Edinburgh
52. Andrew Michael Soward, Newcastle University
53. Alan Hood, University of St Andrews
54. Radostin Simitev, University of Glasgow
55. David MacTaggart, University of Glasgow
56. David Fearn, University of Glasgow
57. Nicholas Hill, University of Glasgow
58. Luigi Vergori, University of Glasgow
59. Steven Roper, University of Glasgow
60. Peter Stewart, University of Glasgow
61. Kirill Kuzanyan, Russian Academy of Sciences
62. Mat Hunt, University of Bath
63. Gunnar Hornig, University of Dundee

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— Website —

<http://www.gla.ac.uk/schools/mathematicsstatistics/events/conferences/ukmhd2016>