Jun Ma

Assistant Professor (Lecturer), Head of Applied Superconductivity Lab
School of Electrical, Electronic and Mechanical Engineering, University of Bristol
Merchant Venture Building, Woodland Road, Bristol, BS8 1UB, U.K.
Phone: +44 07706611128; Email: jun.ma@bristol.ac.uk;
URL: https://research-information.bris.ac.uk/en/persons/jun-ma

Education

2016-2020 PHD in Engineering, University of Cambridge

2013-2016 M.Eng in Electrical Engineering, Shanghai Jiao Tong University, China

2009-2013 B.Eng in Electrical Engineering & Automation, Zhejiang University, China

2017-2018 Visiting PhD Scholar, Department of Material Science and Engineering, North Carolina State University, U.S.A.

Working Experience

2022-present Assistant Professor (Lecturer), School of Electrical, Electronic and Mechanical Engineering, University of Bristol

2020-2022 Associate Professor, Department of Electrical Engineering, Hunan University, China

Other Appointments and Affiliations

2024-present Academic Supervisor, **EPSRC CDT in Superconductivity: Enabling Transformative Technologies.** (£10m, University Bristol, University of Cambridge, University of Oxford).

2023-present **Early Career Officer (ECO)**, **European Society of Applied Superconductivity (ESAS)**

2023-present **Board Member**, **European Society of Applied Superconductivity (ESAS)**

2024-present Editorial Board Member,《*Chinese Journal of Electrical Engineering*》

2022-present Associate Editor & Early Career Editorial Board Member,《Superconductivity》

2021-2026 Technical Editor,《IEEE Transactions on Applied Superconductivity》

2018-2025 Session Chair, Applied Superconductivity Conference (ASC)/ Internal Conference on Magnet Technology (MT) / European Conference on Applied Superconductivity (EUCAS).

Research Grant & Research Scholarship

2026-2030 UKAEA FOSTER funding scheme (industry funding for a PhD Project), "Electromagnetic characteristics of HTS REBCO Tape after fusion-relevant irradiation". **PI, £152,000.**

2025-2029 UKAEA FOSTER funding scheme (industry funding for a joint PhD Project), "Research on AC loss of HTS fusion magnets". **PI, £60,000.**

2022-2023 University of Bristol - EPSRC Core Equipment Award (start-up grant for Superconducting Lab), **PI**, **£38,000**

2020-2022 Hunan University - start-up grant: "High temperature superconducting high-current flux pump wireless charging technology", **PI**, **500,000 RMB** (**£62,000**)

2020-2022 Japan Society for the Promotion of Science (JSPS) Postdoctoral Fellowship: "Multi-physics quench phenomena of high current high temperature superconducting cables", **Principal Investigator**, **£55,000**

2017-2018 USA National Academy of Engineering - Vest Scholar Program (*NAE Grand Challenges for Engineering International Scholarship Program*): "Provide energy from fusion: High temperature superconductors for fusion energy", **$30,000** (**£24,000**)

2016-2020 Cambridge Trust - China Scholarship Council (CSC) PhD full scholarship: 'Wireless flux pumping technology for no-insulation high temperature superconducting magnets', **£140,000**

Awards & Honors

2020 **JSPS (Japan Society for the Promotion of Science) Postdoctoral Fellowship** *(115/1200, rate 10%)*

2020 **IEEE Council on Superconductivity Graduate Study Fellowship** *(6 / year) (only 1 from UK)*

2017 **USA National Academy of Engineering - Vest Scholarship** *(10 / year) (only 1 from University of Cambridge)*

2016 **Cambridge Trust - China Scholarship Council (CSC) PhD Full Scholarship** *(30 / year) (only 2 from SJTU)*

2016 Excellent Graduates Award, Shanghai Jiao Tong University. (top 10%)

2015 Taida Scholarship, Shanghai Jiao Tong University. *(only 2 from SJTU)*

2014 1st-class Academic Excellent Scholarship, Shanghai Jiao Tong University. *(ranking 2nd/180)*

2013 Excellent Undergraduate Graduation Dissertation Award, Zhejiang University. *(top 10%)*

2010 Academic Excellent Scholarship, Zhejiang University. *(top 10%)*

Undergraduate Teaching

Year-1 unit Principles of Electro-Mechanical Design and Analysis (EENG10002)

Year-2 unit Electro-Mechanical Energy Conversion (EENG20002)

Year-2 unit Electrical Energy Conversion and Supply (EENG20005)

Year-2 unit Electro-Mechanical Engineering Practice (EENG20006)

Year-3 unit Superconducting Electrical Power Technology

Year-3 Project Individual / Group Research Projects, Academic Supervisor

Year-3 Project Year-in-Industry Placement (for 1 year), Academic Supervisor

Award for Teaching & Supervision

2024 **Fellowship for High Education Academy (FHEA)**

2022 **Excellent Supervisor** for Undergraduate Final-year Graduation Thesis, Hunan University. *(top 10%)*

2021 **Excellent Teaching Award** (3rd Prize) in Hunan University New Faculty Teaching Competition.

External examination & assessor

2024 Invited Reviewer for **UKRI Future Leaders Fellowship** (Round 9).

2023 External PhD Examiner: "Laser Powered Actuator", University of York

2023 External Assessor for University of Cambridge - Junior Research Fellowship applications.

2022 External Assessor for Italian Science Fund (ISF), Italian National Committee for Research Evaluation.

Impact and Publicity

2020 University of Cambridge / Department of Engineering / News. (2020) for "Fellowship awarded for applied superconductivity research".
http://www.eng.cam.ac.uk/news/fellowship-awarded-applied-superconductivity-research

2020 IEEE Council on Superconductivity (CSC) / Awards / IEEE CSC Graduate Study Fellowship in Applied Superconductivity / 2020-Class. (2020)
https://ieeecsc.org/awards/ieee-csc-graduate-study-fellowship-applied-superconductivity

Publications List - the past 5 years

(*: Corresponding Author)

[J39] 2026 **Jun Ma***, et al. Experimental and numerical study of the AC loss of a small HTS REBCO winding for a fully electrical machine. ***IEEE Transactions on Applied Superconductivity.*** 2026.

[J38] 2026 Bin Feng, **Jun Ma***, et al. Three-Dimensional Electromagnetic-Mechanical Coupled Modelling of Multilayer HTS REBCO Coated Conductors Considering Strain Effects. ***Superconductor Science and Technology***, 39 (3), 035008, 2026.

[J37] 2026 Bin Feng, **Jun Ma***, et al. Experimental Study on the Dynamic Resistance of HTS REBCO coated conductor Tape, ***IEEE Transactions on Applied Superconductivity***, 36 (5), 1-7, 2026.

[J36] 2026 Hanlin Zhu, **Jun Ma***, et al. Cross-platform J-A Modelling for High Temperature Superconducting Applications with Nonlinear Ferromagnetic Materials, ***Superconductor Science and Technology***, 39 (3), 035002, 2026.

[J35] 2026 Xuezhi Luo, **Jun Ma***, et al. Concept Design and Optimization of A 3 MW fully Superconducting Synchronous Electrical Machine for Electric Aircraft. ***Superconductor Science and Technology.*** 39 (3), 035007, 2026.

[J34] 2025 Hanlin Zhu, **Jun Ma***, et al. Novel modelling and simulation of Superconducting System based on ***J***(MATLAB)-***A***(COMSOL) Model, ***IEEE Transactions on Applied Superconductivity***, 36 (3), 1-6, 2025.

[J33] 2025 Hanlin Zhu, **Jun Ma***, et al. "J-Φ coupled model based on integral methods and magnetic networks for superconductor." ***Superconductor Science and Technology***, 2025.

[J32] 2025 Xuezhi Luo, **Jun Ma***, et al. "Dynamic resistance and loss analysis of a small HTS REBCO magnet carrying direct currents under perpendicular DC-biased and AC magnetic fields". ***Superconductor Science and Technology*** 38 (10), 105010, 2025.

[J31] 2025 Xuezhi Luo, **Jun Ma***, et al. "Multiphysics multilayer modelling and simulation of HTS REBCO magnets carrying direct currents under AC magnetic fields." ***Superconductivity*** 14, 100157, 2025.

[J30] 2025 Liechen Zhou, Jie Sheng, Junjie Jiang, **Jun Ma**, Boyang Shen, Mingyang Wang, and Zhijian Jin. "Combined effects of fiber structure, coating and coupling methods on the fiber-optic quench response in HTS CORC cables". ***Superconductor Science and Technology***, 38(10), p.105016, 2025.

[J29] 2024 Huaqian Xiao, **Jun Ma***, et al. "Dynamic resistance of a REBCO tape carrying direct current under a mixture magnetic field of AC field with DC-biased field." ***Superconductor Science and Technology*** 37 (11), 115006, 2024.

[J28] 2024 Yueming Sun, **Jun Ma**, Shuangrong You, Rodney A. Badcock, and Zhenan Jiang. "Numerical determination of the threshold magnetic field in superconducting strips and coils triggering dynamic resistance." ***Superconductor Science and Technology*** 37, no. 12 (2024): 12LT02.

[J27] 2024 Yuanhang Pan, Jiangtao Yang, Qing Li, Shoudao Huang, and **Jun Ma**. "Novel Hybrid Excitation High Temperature Superconducting Homopolar Inductor Alternator for Aviation Turbo-Electric System." ***IEEE Transactions on Applied Superconductivity*** (2024).

[J26] 2024 Yuanhang Pan, Jiangtao Yang, Qing Li, Shoudao Huang, Chuang Gao, and **Jun Ma**. "Investigation and suppression of external alternating field of HTS excitation coil in homopolar inductor machine." ***IEEE Transactions on Magnetics*** (2024).

[J25] 2024 Yuanhang Pan, Jiangtao Yang, Qing Li, Xuezhi Luo, Shoudao Huang, Chuang Gao, and **Jun Ma**. "Design of HTS excitation coil for homopolar inductor machine considering critical current reduction of local turn." ***IEEE Transactions on Industry Applications*** (2024).

[J24] 2024 Yuanhang Pan, Jiangtao Yang, Xuezhi Luo, Huaqian Xiao, and **Jun Ma**. "A method for calculating critical current of high temperature superconducting machine based on magnetic vector potential." ***IEEE Transactions on Applied Superconductivity*** 34, no. 5 (2024): 1-6.

[J23] 2024 Qiao Li, Biyan Xie, Yechi Zhang, **Jun Ma**, and Chao Yuan. "A general analytical model of single-layer common-mode chokes." ***IEEE Transactions on Power Electronics*** (2024).

[J22] 2023 **Jun Ma***, et al. "Design of a 10 kW superconducting homopolar inductor machine based on HTS REBCO magnet." ***IEEE Transactions on Applied Superconductivity*** 34, no. 5 (2023): 1-7.

[J21] 2023 Yuanhang Pan, Jiangtao Yang, Qing Li, Xuezhi Luo, Shoudao Huang, and **Jun Ma**. "Optimal design of a high temperature superconducting homopolar inductor machine." In ***26th International Conference on Electrical Machines and Systems (ICEMS)***, pp. 3920-3925. IEEE, 2023.

[J20] 2023 Zhaokai Li, Xiaoyan Huang, **Jun Ma**, et al. "Hybrid Analytical Model for Predicting the Electromagnetic Losses in Surface-Mounted Permanent-Magnet Motors". ***IEEE Transactions on Transportation Electrification***, 2023.

[J19] 2023 Qiao Li, Xiaokang Zhang, Chao Yuan, **Jun Ma**, and Dong Jiang. "Variable Switching Frequency DPWM for ZVS in AC Motor Drive Fed by Two Paralleled SiC Inverters With Coupled Inductors." ***IEEE Transactions on Power Electronics***, 2023.

[J18] 2023 **Jun Ma**, et al. "A numerical design of high-resistance and energy-efficient HTS switch based on dynamic resistance". ***IEEE Transactions on Applied Superconductivity***, 2023.

[J17] 2023 Adil Shah*, **Jun Ma***, et al. "Stator Optimization for HTS Rotating Permanent Magnets Based Flux Pump", ***Physica C: Superconductivity and its Applications***, 2023.

[J16] 2022 Jintao Hu, **Jun Ma***, et al. "Impact of magnetic substrate on dynamic loss and magnetization loss of HTS coated conductors". ***IEEE Transactions on Applied Superconductivity***, 2022.

[J15] 2022 Jintao Hu, **Jun Ma***, et al. "Thermal behavior modelling of a fast AC field controlled HTS switch". ***IEEE Transactions on Applied Superconductivity*****,** 2022.

[J14] 2022 Adil Shah, Yavuz Ozturk, Huan Huang, Ismail Patel, **Jun Ma**, et al. A Novel Switch Design for Compact HTS Flux Pumps. ***IEEE Transactions on Applied Superconductivity***. 2022.

[J13] 2022 Luning Hao, B Shen, **Jun Ma**, et al. Conceptual design and optimization of HTS Roebel tapes. ***IEEE Transactions on Applied Superconductivity***. 2022.

[J12] 2021 Jintao Hu, **Jun Ma***, et al. "Numerical Study on Dynamic Resistance of a HTS Switch Made of Series-Connected YBCO Stacks". ***IEEE Transactions on Applied Superconductivity****, 31(5), 1-6. 2021*

[J11] 2021 Jiabin Yang, M Tian, **Jun Ma**, et al. Numerical Study on AC loss Characteristics of Conductor on Round Core (CORC) Cables under Transport Current and Magnetic Field. ***IEEE Transactions on Applied Superconductivity***, Jun 22, 2021.

[J10] 2021 Yavuz Ozturk, B Shen, R Williams, J Gawith, J Yang, **Jun Ma**, *et al*. Current Status in Building a Compact and Mobile HTS MRI Instrument. ***IEEE Transactions on Applied Superconductivity***, 31(5), 1-5, 2021.

[J9] 2021 Mengyuan Tian, J Yang, B Shen, Y Ozturk, **Jun Ma**, et al. Analysis on the Effect of Superconductor Layer Thickness on the AC Loss of Conductor on Round Core (CORC) Cables. ***IEEE Transactions on Applied Superconductivity***, 2021.

[J8] 2021 Mengyuan Tian, J Yang, B Shen, Y Ozturk, **Jun Ma**, et al. Magnetization loss characteristics in superconducting conductor on round core cables with a copper former. ***IEEE Transactions on Applied Superconductivity***, Jun 14, 2021.

[J7] 2020 **Jun Ma**, *et al*. "A temperature-dependent multilayer model for direct current carrying HTS coated-conductors under perpendicular AC magnetic fields". ***Superconductor Science and Technology*** 33 (4), 045007, 2020. **(citation = 98)**

[J6] 2020 **Jun Ma**, *et al*. "Impact of Stabilizer Layers on the Thermal-Electromagnetic Characteristics of Direct Current Carrying HTS Coated Conductors under Perpendicular AC Magnetic Fields". ***IEEE Transactions on Applied Superconductivity****.* 30 (4), 1-6, 2020.

[J5] 2019 **Jun Ma**, *et al*. "High-temperature superconducting (HTS) transformer-rectifier flux pump for powering no-insulation superconducting magnet with low characteristic resistance". ***Physica C: Superconductivity and its Applications***, *560*, 1-6. 2019.

[J4] 2019 **Jun Ma**, *et al*. "Rotating Permanent Magnets Based Flux Pump for HTS No-Insulation Coil". ***IEEE Transactions on Applied Superconductivity***, 29 (5), 1-6. 2019.

[J3] 2017 **Jun Ma**, *et al*. "Flux pumping for non-insulated and metal-insulated HTS coils". ***Superconductor Science and Technology***, 31(1), 015018, 2017.

[J2] 2016 **Jun Ma**, *et al*. "Axial tension and overcurrent study on a type of mass-producible joint for ReBCO coated conductors". ***IEEE Transactions on Applied Superconductivity***, 26(4), 1-5. 2016.

[J1] 2016 **Jun Ma**, *et al*. "Experimental and Numerical Study of a DC Induction Heater Prototype With an Adjustable Air Gap Structure". ***IEEE Transactions on Applied Superconductivity***, 26(4), 1-5. 2016.