

Jesse Liu

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| APPOINTMENTS | Junior Research Fellow, Trinity College, University of Cambridge, UK On leave Oct 2019 – Sep 2021 Grainger Postdoctoral Fellow, University of Chicago, USA | 2019 – present 2019 – 2021 |
| EDUCATION | DPhil Particle Physics, University of Oxford, UK Two-year research stay at CERN, Switzerland Thesis: ‘Discovery strategies for dark matter and Higgsinos at the LHC’ Supervisors: Alan Barr and John March-Russell MSc Physics, Perimeter Institute and University of Waterloo, Canada Essay: ‘Field theory for continuous-spin particles’ Supervisor: Natalia Toro BA Physics, University of Oxford, UK | 2015 – 2019 2014 – 2015 2011 – 2014 |
| AWARDS & SCHOLARSHIPS | Idea Day Prize, ATLAS Collaboration Junior Research Fellowship (4 years, any discipline), Trinity College, Cambridge Grainger Postdoctoral Fellowship (2 years, any field of physics), University of Chicago Best Poster (1st out of 226 entries), International Conference on High Energy Physics Travel Grant, International Conference on High Energy Physics Santander Academic Travel Award, University of Oxford Postgraduate Studentship, PhD scholarship from STFC PSI Award, MSc scholarship from Perimeter Institute and University of Waterloo Fitzgerald Prize, Exeter College, Oxford Summer Research Studentship, Oxford Particle Physics Gibbs Prize, winner of Oxford physics speaking competition East Scholarship, Exeter College, Oxford Fitzgerald Prize, Exeter College, Oxford Essay Prize, winner of Institute of Physics essay competition | 2021 2019 2019 2018 2018 2018 2015 2014 2014 2013 2013 2012 2012 2012 |
| PAPERS | All papers available at INSPIREHEP. ATLAS author since 2017. Particle physics convention lists authors alphabetically. Selected papers with direct personal contributions: <ul style="list-style-type: none">• L. Beresford, S. Clawson and J. Liu, ‘Strategy to measure tau $g - 2$ via photon fusion in LHC proton collisions’, arXiv:2403.06336• ATLAS Collaboration (J. Liu Editor), ‘Observation of the $\gamma\gamma \rightarrow \tau\tau$ Process in Pb+Pb Collisions and Constraints on the τ-lepton Anomalous Magnetic Moment with the ATLAS Detector’, Phys. Rev. Lett. 131 (2023) 151802, arXiv:2204.13478 ▷ <i>PRL Editors’ Suggestion, ATLAS Physics Briefing, The Conversation feature</i>• ATLAS Collaboration (J. Liu Chair of Editorial Board), ‘Exclusive dielectron production in ultraperipheral Pb+Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV with ATLAS’, JHEP 06 (2023) 182, arXiv:2207.12781• ATLAS Collaboration (J. Liu Member of Editorial Board), ‘Measurement of the total cross section and ρ-parameter from elastic scattering in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS | |

detector', Eur. Phys. J. C **83** (2023) 441, arXiv:2207.12246

▷ *On the Cover, ATLAS Physics Briefing*

- **J. Liu**, K. Dona, G. Hoshino, S. Knirck, N. Kurinsky, M. Malaker, D. W. Miller, A. Sonnenschein, M. H. Awida, P. S. Barry, K. K. Berggren, D. Bowring, G. Carosi, C. Chang, A. Chou, R. Khatiwada, S. Lewis, J. Li, S. W. Nam, O. Noroozian, T. X. Zhou, 'Broadband Solenoidal Halo-scope for Terahertz Axion Detection', Phys. Rev. Lett. **128** (2022) 131801, arXiv:2111.12103
▷ *On the Cover and PRL Editors' Suggestion, UChicago News Release*
- K. Dona, **J. Liu**, N. Kurinsky, D. Miller, P. Barry, C. Chang, A. Sonnenschein, 'Design and performance of a multi-terahertz Fourier transform spectrometer for axion dark matter experiments', JINST **17** (2022) P06014, arXiv:2104.07157
- ATLAS Collaboration (**J. Liu** Editor & Lead Analyzer), 'Observation and Measurement of Forward Proton Scattering in Association with Lepton Pairs Produced via the Photon Fusion Mechanism at ATLAS', Phys. Rev. Lett. **125** (2020) 261801, arXiv:2009.14537
▷ *ATLAS Physics Briefing, CERN Courier feature*
- J. Amacker, W. Balunas, L. Beresford, D. Bortoletto, J. Frost, C. Issever, **J. Liu**, J. McKee, A. Micheli, S. Paredes Saenz, M. Spannowsky, B. Stanislaus, 'Higgs self-coupling measurements using deep learning in the $b\bar{b}b\bar{b}$ final state', JHEP **12** (2020) 115, arXiv:2004.04240
- ATLAS Collaboration, 'Searches for electroweak production of supersymmetric particles with compressed mass spectra in $\sqrt{s} = 13$ TeV pp collisions with the ATLAS detector', Phys. Rev. D **101** (2020) 052005, arXiv:1911.12606
- L. Beresford and **J. Liu**, 'New physics and tau $g - 2$ using LHC heavy ion collisions', Phys. Rev. D **102** (2020) 113008, arXiv:1908.05180
▷ *ParticleBites feature*
- I. Dawson, B. Gallop, **J. Liu**, P. Miyagawa, P. Phillips, G. Pownall, D. Robinson and A. Weidberg, 'In situ radiation damage studies of optoelectronics in the ATLAS Semiconductor Tracker', JINST **14** (2019) P07014
- L. Beresford and **J. Liu**, 'Search Strategy for Sleptons and Dark Matter Using the LHC as a Photon Collider', Phys. Rev. Lett. **123** (2019) 141801, arXiv:1811.06465
- ATLAS Collaboration (**J. Liu** Editor & Lead Analyzer), 'Search for electroweak production of supersymmetric states in scenarios with compressed mass spectra at $\sqrt{s} = 13$ TeV with the ATLAS detector', Phys. Rev. D **97** (2018) 052010, arXiv:1712.08119
▷ *Two ATLAS Physics Briefings, CERN Courier feature, Oxford Physics highlight*
- A. Barr and **J. Liu**, 'Analysing parameter space correlations of recent 13 TeV gluino and squark searches in the pMSSM', Eur. Phys. J. C **77** (2017) 202, arXiv:1608.05379
- A. Barr and **J. Liu**, 'First interpretation of 13 TeV supersymmetry searches in the pMSSM', arXiv:1605.09502, Published with 1608.05379 in Eur. Phys. J. C **77** (2017) 202
▷ *Oxford Physics highlight*

INVITED
SEMINARS

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| New York University, Experimental Particle Physics Seminar, USA | 5 Mar 2024 |
| University of California, Irvine, Particle Physics Seminar, USA | 20 Feb 2024 |
| Sorbonne Université, LP THE Phenomenology Seminar, France | 3 Oct 2023 |
| Institut d'Astrophysique de Paris, ICAP Seminar, France (Online) | 22 Jun 2023 |
| University of Sydney, CPPC Seminar, Australia (Online) | 4 May 2023 |
| Johns Hopkins University, Experimental Particle Physics Seminar, USA | 5 Apr 2023 |

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| | Massachusetts Institute of Technology, LNS Colloquium, USA | 27 Feb 2023 |
| | Brown University, High Energy Experiment Seminar, USA | 15 Feb 2023 |
| | University of Edinburgh, Experimental Particle Physics Seminar, UK | 27 Jan 2023 |
| | University of Bristol, Particle Physics Seminar, UK | 7 Dec 2022 |
| | University of Liverpool, HEP Seminar, UK | 16 Nov 2022 |
| | Imperial College London, HEP Seminar, UK | 15 Jun 2022 |
| | University of Warwick, Particle Physics Seminar, UK | 9 Jun 2022 |
| | Cornell University, LEPP Journal Club Seminar, USA (Online) | 6 May 2022 |
| | Perimeter Institute for Theoretical Physics, Particle Physics Seminar, Canada | 3 May 2022 |
| | Case Western Reserve University, Particle/Astro Seminar, USA (Online) | 1 Mar 2022 |
| | University of Cambridge, Cavendish HEP Seminar, UK | 30 Nov 2021 |
| | University of Tennessee, Knoxville, HEP Seminar, USA (Online) | 8 Sep 2021 |
| | Cornell University, LEPP Journal Club Seminar, USA (Online) | 30 Oct 2020 |
| | Stony Brook University, Particle Physics Seminar, USA (Online) | 19 Oct 2020 |
| | University of Pittsburgh, PITT PACC Seminar, USA (Online) | 5 Aug 2020 |
| | SLAC Stanford University, Particle Physics Theory Seminar, USA | 12 Feb 2020 |
| | Fermilab, Cosmic Physics Center Chalk Talk, USA | 14 Nov 2019 |
| | Fermilab, LPC Physics Forum, USA | 31 Oct 2019 |
| | University of Cambridge, Cavendish HEP Seminar, UK | 19 Feb 2019 |
| | LBNL University of California, Berkeley, RPM Seminar, USA | 20 Nov 2018 |
| | SLAC Stanford University, Joint Theory–Experiment Seminar, USA | 20 Apr 2018 |
| | Perimeter Institute for Theoretical Physics, BSM Seminar, Canada | 17 Apr 2018 |
| | University of California, Santa Cruz, SCIPP Seminar, USA | 10 Apr 2018 |
| | University of Oxford, Dalitz Seminar, UK | 19 Jan 2017 |
| | University of Cambridge, Joint DAMTP–Cavendish Seminar, UK | 13 Jan 2017 |
| CONFERENCE & WORKSHOP TALKS | Cavendish HEP Research Extravaganza, Cambridge, UK | 6 Dec 2023 |
| | CADEX Collaboration Meeting, Spain (Online) | 16 Nov 2023 |
| | BREAD Collaboration Meeting, Chicago, USA | 5 Oct 2023 |
| | European Physical Society (EPS) HEP Conference, Hamburg, Germany | 24 Aug 2023 |
| | Dark Matter Beyond the Weak Scale Conference, Liverpool, UK | 28 Mar 2023 |
| | Photon-induced Processes Workshop, Durham, UK | 3 Nov 2022 |
| | Dark Matter UK Meeting, London, UK | 22 Sep 2022 |
| | International Conference on High Energy Physics (ICHEP), Bologna, Italy | 8 Jul 2022 |
| | Institute of Physics (IoP) Joint APP HEPP Conference, Harwell, UK | 5 Apr 2022 |
| | Snowmass Cosmic Frontier CF2 Wavelike DM Meeting (Online) | 8 Oct 2021 |
| | American Physical Society (APS) DPF Meeting, Florida State, USA (Online) | 14 Jul 2021 |
| | Phenomenology Symposium, Pittsburgh, USA (Online) | 25 May 2021 |
| | American Physical Society April Meeting (Online) | 20 Apr 2021 |
| | DIS Conference, Stony Brook, USA (Online) | 14 Apr 2021 |
| | LHC Forward Physics Meeting (Online) | 4 Mar 2021 |
| | Forward Physics and QCD with LHC, EIC and Cosmic Rays (Online) | 23 Jan 2021 |
| | Snowmass Energy Frontier EF09 BSM Meeting (Online) | 4 Sep 2020 |
| | ICHEP Conference, Prague, Czech Republic (Online) | 30 Jul 2020 |
| | Snowmass Energy Frontier Joint Preparatory Session (Online) | 8 Jul 2020 |
| | Higgs Couplings Conference, Oxford, UK | 2 Oct 2019 |
| | Young Experimentalists & Theorists Institute, Durham, UK | 8 Jan 2019 |
| | LHC Forward Physics Workshop, CERN, Switzerland | 18 Dec 2018 |
| | Oxford–Durham Di-Higgs Workshop, Durham, UK | 6 Nov 2018 |

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| | SUSY Conference, Barcelona, Spain | 23 Jul 2018 |
| | ICHEP Conference, Seoul, South Korea | 6 Jul 2018 |
| | DM@LHC Workshop, Heidelberg, Germany | 5 Apr 2018 |
| | Institute of Physics Joint APP HEPP Conference, Bristol, UK | 27 Mar 2018 |
| | Young Theorists Forum, Durham, UK | 10 Jan 2018 |
| | Young Theorists Forum, Durham, UK | 11 Jan 2017 |
| | 2nd LHC BSM Reinterpretation Workshop, CERN, Switzerland | 14 Dec 2016 |
| | Theoretical Particle Physics Summer School, Manchester, UK | 31 Aug 2016 |
| | 1st LHC BSM Reinterpretation Workshop, CERN, Switzerland | 17 Jun 2016 |
| COLLABORATION PLENARIES | ATLAS HV Breakdown Task Force Meeting (Online) | 16 Feb 2024 |
| | ATLAS SM Workshop, Prague, Czechia | 12 Sep 2023 |
| | ATLAS HV Breakdown Task Force Meeting (Online) | 28 Jul 2023 |
| | ATLAS ITk Strips Module Meeting (Online) | 18 Jul 2023 |
| | ATLAS UK Meeting, Manchester, UK | 9 Jan 2023 |
| | ATLAS SUSY Workshop, CERN, Switzerland | 19 Sep 2022 |
| | ATLAS ITk WP12 Meeting, Birmingham, UK | 31 Mar 2022 |
| | ATLAS Upgrade Physics (Online) | 22 Apr 2021 |
| | ATLAS SM Plenary (Online) | 15 Apr 2021 |
| | ATLAS Run 4 Roman Pot Meeting (Online) | 26 Mar 2021 |
| | ATLAS Idea Day (Online) | 20 Jan 2021 |
| | ATLAS Roman Pot General Meeting (Online) | 7 Oct 2020 |
| | ATLAS SM Jamboree (Online) | 30 Sep 2020 |
| | ATLAS SM Plenary Analysis Closure (Online) | 2 Jul 2020 |
| | ATLAS Week Plenary on SM & AFP (Online) | 24 Jun 2020 |
| | ATLAS Roman Pot General Meeting, CERN, Switzerland | 23 Jan 2020 |
| | ATLAS Hadronic Final State Forum, Chicago, USA | 20 Dec 2019 |
| | ATLAS UK SUSY–Exotics Meeting, Cambridge, UK | 11 Apr 2019 |
| | ATLAS SUSY Run 3 Ideas, CERN, Switzerland | 22 Nov 2018 |
| | ATLAS SUSY Plenary, CERN, Switzerland | 19 Jul 2018 |
| | ATLAS Exotics Workshop, Rome, Italy (poster) | 29 May 2018 |
| | ATLAS Week Plenary on SUSY, CERN, Switzerland | 21 Feb 2018 |
| | ATLAS Analysis Open Presentation, CERN, Switzerland | 1 Nov 2017 |
| | ATLAS Exotics–SUSY Workshop, Bucharest, Romania | 12 May 2017 |
| | ATLAS SUSY Electroweak, CERN, Switzerland | 10 Feb 2017 |
| | ATLAS UK Meeting, Liverpool, UK | 5 Jan 2017 |
| | ATLAS Week Plenary on SCT/ID Gen, CERN, Switzerland | 17 Oct 2016 |
| MENTORING & TEACHING | Graduate student collaborators | |
| | Kristin Dona, PhD student, UChicago | 2019 – 2021 |
| | Savannah Clawson, PhD student, Manchester | 2019 – 2020 |
| | Santiago Paredes Saenz, PhD student, Oxford | 2018 – 2020 |
| | Beojan Stanislaus, PhD student, Oxford | 2018 – 2020 |
| | Gabriel Gallardo, PhD student, Oxford | 2018 – 2019 |
| | Gavin Pownall, PhD student, Oxford | 2018 – 2019 |
| | Undergraduate student collaborators | |
| | Joe Ray, MPhys student, Oxford | 2018 – 2019 |
| | Dan Kreso, MPhys student, Oxford | 2017 – 2018 |
| | Alessandro Micheli, summer student, Oxford | 2018 |

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| | Ewan McCullough, summer student, Oxford | 2017 |
| | Charles Sillett, summer student, Oxford/CERN | 2017 |
| | Panelist, ‘Working with your PhD supervisor’ workshop, Trinity College | 2023 |
| | Trinity College Postdoc-PhD mentoring programme | 2022 |
| | Pre-doctoral career mentoring (3 students) | 2021, 2018 |
| | Lecturer, Oxford undergraduate summer students: ‘The Standard Model’ | Jul 2018 |
| | Tutor, Oxford 3rd year undergraduates: ‘Flows, Fluctuations & Complexity’ | May 2016 |
| | Tutor, Oxford 3rd year undergraduates: ‘Subatomic Physics’ | May 2016 |
| LEADERSHIP & SERVICE | Convenor for LHC Forward Physics Working Group | 2023 – present |
| | ▷ Co-organizer of March 2024 LHC Physics Centre at CERN workshop program and speakers | |
| | Convenor of ATLAS Standard Model Soft QCD physics group | 2022 – present |
| | ▷ Coordination role organizing program of 20 analyses probing non-perturbative dynamics | |
| | ▷ Coordinated group strategy, bi-weekly plenary meetings, Standard Model workshop agendas | |
| | ATLAS Inner Tracker (ITk) silicon strips upgrade module production | 2021 – present |
| | ▷ Led assembly and quality control of 40+ ITk strips modules to prove production readiness | |
| | ▷ Commissioned module thermal cycling, developed high-voltage controls and interlocks | |
| | Convenor for Run 4 AFP Task Force on HL-LHC physics projections | 2021 – 2022 |
| | ▷ Coordination role organizing physics and performance for ATLAS Forward Proton upgrade | |
| | ▷ Chaired meetings discussing beam optics, detector performance and physics opportunities | |
| | ATLAS Forward Proton combined performance and data preparation | 2019 – 2020 |
| | ▷ Led scrutiny of AFP data quality, detector efficiency, energy scale calibration, simulation | |
| | ▷ Delivered first collaboration-wide AFP performance recommendations for 2017 dataset | |
| | Grant expert reviewer for National Science Centre, Poland | 2023 |
| | Journal referee for Annalen der Physik | 2023 |
| | Institute reading internal peer-review (Heavy-ion and Higgs), Cambridge ATLAS | 2023 |
| | Contributing author, Snowmass whitepaper ‘Axion Dark Matter’, 2203.14923 | 2022 |
| | UChicago ATLAS website development | 2021 |
| | Journal referee for Nuclear Physics B | 2021 |
| OUTREACH | Institute reading coordination (Trigger), UChicago ATLAS group | Dec 2019, Sep 2020 |
| | Coordinator for Snowmass Letter of Interest on terahertz axions | Aug 2020 |
| | Grainger Fellowship website development, UChicago Physics | Jul 2020 |
| | Postdoctoral community working group, UChicago KICP | Jul 2020 |
| | Journal club, UChicago ATLAS group | May 2020 |
| | Graduate open day speaker & poster, Oxford Particle Physics | Dec 2018 |
| | Institute paper reading (Supersymmetry), Oxford ATLAS group | Jul 2018 |
| | Organising committee member, YETI 2017, Durham University | Sep 2016 |
| | Physics aptitude test marker, Oxford undergraduate admissions | Nov 2015 |
| | Resident advisor for US visiting students, Williams-Exeter Programme at Oxford | 2012 – 2014 |
| | Publicity officer, Oxford Undergraduate Physics Conference | Mar 2013 |
| | The Conversation, news article with science journalists on taus in heavy ions | 17 Oct 2023 |
| | Sidney Sussex MCR Research Conference, Cambridge, invited guest speaker | 4 Mar 2023 |
| | Interviewed for UChicago news article on BREAD axion experiment proposal | 12 Apr 2022 |
| | ATLAS Physics Briefing, news article on taus in heavy ions result | 7 Apr 2022 |
| | Trinity College Science Society Symposium, ‘Dark matter and colossal colliders’ | 13 Mar 2022 |
| | CERN Courier magazine article, ‘The LHC as a photon collider’ | 15 Aug 2020 |

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| ATLAS Physics Briefing, online news article on AFP result | 30 Jul 2020 |
| Trinity Forum, Cambridge, ‘Dark matter at the LHC’ invited talk | 5 Jun 2019 |
| Pint of Science, Manchester, ‘Using light to reveal the darkness’ invited talk | 20 May 2019 |
| Oxford HiggsHunters, mentoring secondary school students | 26 – 27 Jun 2018 |
| CERN school visit, hosting 35 sixth form students, teacher engagement | 15 Feb 2018 |
| FQXi essay, information in physics and biology | 3 Mar 2017 |
| Lunch with CERN scientists, physics discussions with school students | 21 Oct 2016 |
| Oxfordshire Science Festival, all-day live physics demos on Broad Street | 26 Jun 2016 |
| Perimeter Institute PSI Blog, ‘Surprises of spin’ | 15 May 2016 |
| Out of this World: Family Fun Day, targeting under-represented at university | 17 Apr 2016 |
| Oxford Catz Exchange, ‘Seeing the unseeable’ talk | 25 Feb 2016 |
| Oxford FameLab, ‘Listening to numbers’ talk | 25 Jan 2016 |
| Oxford Stargazing Live, all-day live demos at particle physics stall | 16 Jan 2016 |
| Oxford Science Christmas Lectures, mentoring school students | 8 Dec 2015 |
| Oxford Flash Talk Physics, ‘Fiddling with physics’ invited talk | 4 Dec 2013 |
| Institute of Physics essay, ‘Predicting the unpredictable’ | 30 May 2012 |