

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• S. Knirck, G. Hoshino, et. al. (BREAD Collaboration), ‘First Results from a Broadband Search for Dark Photon Dark Matter in the 44 to 52 μeV Range with a Coaxial Dish Antenna’, Phys. Rev. Lett. 132 (2024) 131004, arXiv:2310.13891• 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 $\sqrt{s_{\text{NN}}} = 5.02$ 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 Stopped 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

New York University, Experimental Particle Physics Seminar, USA
University of California, Irvine, Particle Physics Seminar, USA
Sorbonne Université, LPTHE Phenomenology Seminar, France
Institut d’Astrophysique de Paris, ICAP Seminar, France (Online)

5 Mar 2024
20 Feb 2024
3 Oct 2023
22 Jun 2023

	University of Sydney, CPPC Seminar, Australia (Online)	4 May 2023
	Johns Hopkins University, Experimental Particle Physics Seminar, USA	5 Apr 2023
	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
	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
	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 2024 LHC Physics Centre at CERN workshop program and speakers	
	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 of ATLAS Standard Model Soft QCD physics group	2022 – 2024
	▷ Coordination role organizing program of 20 analyses probing non-perturbative dynamics	
	▷ Chaired bi-weekly plenary meetings, steered physics group strategy and workshop agendas	
	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
	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
OUTREACH	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
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