

Neil J. Robinson

Marie Skłodowska-Curie Fellow, Institute for Theoretical Physics, Universiteit van Amsterdam

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Citizenship: British

Languages: English (Native), Dutch (A2)

Work Experience

PERIOD	October 2017 — October 2019	
EMPLOYER	Universiteit van Amsterdam	Amsterdam, The Netherlands
JOB TITLE	Marie Skłodowska-Curie Fellow	

PERIOD	September 2014 — September 2017	
EMPLOYER	Brookhaven National Laboratory	Upton, New York, USA
JOB TITLE	Postdoctoral Research Associate	

Education

PERIOD	October 2010 — August 2014	
DEGREE	DPhil in Theoretical Physics	
ADVISOR	Prof. Fabian Essler	
UNIVERSITY	University of Oxford	Oxford, UK

PERIOD	October 2006 — September 2010	
DEGREE	MPhys Master of Physics	
RANK	First Class (with honours)	
UNIVERSITY	University of Exeter	Exeter, UK

Awards, Honours and Funding

- 2017–2019 Marie Skłodowska-Curie Fellowship (165,000€)
- 2017 Brookhaven National Laboratory Spotlight Award for Exceptional Performance
- 2016 Brookhaven National Laboratory Spotlight Award for Exceptional Performance
- 2010 National Physical Laboratory SET Award, Best UK Physics Student
- Bertie Black Prize, University of Exeter
- Newman Prize, University of Exeter
- 2007–2010 Commendation from the Dean, University of Exeter
- School of Physics Prize, University of Exeter
- Millhayes Academic Scholarship, University of Exeter
- William Williams Trust, Educational Grant

Supervision

TITLE	MSc Thesis Advisor
STUDENTS	Xanthe Verbeek (2018/19)

TITLE	High School Summer Research Student
STUDENTS	Brian Isakov (Summer 2017)

Teaching

TITLE	Student Seminar: Theoretical Physics
POSITION	Course coordinator
TIME	2019, 15 sessions
SIZE	c. 5 students
TOPICS	4 × 10hrs of seminars on: (i) Nonperturbative approaches to 1+1D field theories (coordinator); (ii) Black holes physics (student); (iii) Resummation in QCD (student); (iv) Supersymmetry in field theory (student)
TITLE	Student Seminar: Theoretical Physics
POSITION	Assistant, Project Supervisor, and 6 hrs of lectures
TIME	2018, 15 sessions
SIZE	c. 30 students
TOPICS	Three Facets of 1D Quantum Physics: Integrability/Bethe Ansatz, Bosonization and Refermionization, Conformal Field Theory
TITLE	C6 Theoretical Physics
POSITION	Problems Class Tutor
TIME	2011–13, 6 Terms
SIZE	10–15 students
TOPICS	Many body quantum mechanics, classical and quantum field theory, statistical mechanics, stochastic processes, phase transitions and critical phenomena

Recent Professional Activities

REFEREE	APS Journals: Phys. Rev. Lett., Phys. Rev. X, Phys. Rev. A, Phys. Rev. B IOP Journals: New J. Phys., J. Stat. Mech., J. Phys. A Other Journals: SciPost Phys.
2018–19	MSc Advisor, Xanthe Verbeek (UvA)
2019	Examiner, PhD Thesis Committee of Ana Silva (UvA)
2018	Invited ‘Viewpoint’ article in the online APS publication <i>Physics</i>
2016–17	Executive Board Member, Brookhaven Women in Science (BWIS)
2016–17	Renate W. Chasman Scholarship Committee Chair, BWIS
2016–17	CMPMS Division Seminar Committee Theory Representative
2016–17	Advisor to the Brookhaven National Lab Association of Students and Postdocs
2015–17	Organizing Committee, Early Career Researchers Symposium, Brookhaven National Lab
2016	Organizer, APS–Brookhaven National Lab Author and Referee Tutorial
2015	Presentations Chair, Young Researchers Symposium, Brookhaven National Lab
2015	Board Member, Brookhaven National Lab Association of Students and Postdocs

Recent Outreach

- 2017 Life as a physicist talk to high school students, Brookhaven National Laboratory
Scientist at ‘Meet a Scientist’ high school careers event
Moderator, Long Island Regional High School Science Bowl
Assistant, MoMath Introduction to Scientific Computing
- 2016 Scientist at ‘Meet a Scientist’ high school careers event
Moderator, Long Island Regional Middle School Science Bowl
- 2015 Judge, NY State Science Congress High School Science Fair
Judge, Long Island Regional Elementary School Science Fair
Moderator, Long Island Regional High School Science Bowl

Recent International Collaborators

- THEORY Dr. Bruno Bertini, University of Ljubljana (Slovenia)
 Prof. Jean-Sébastien Caux, University of Amsterdam (the Netherlands)
 Dr. Laura Classen, Brookhaven National Laboratory (USA)
 Dr. Axel Cortés Cubero, Utrecht University (the Netherlands)
 Prof. Fabian Essler, University of Oxford (UK)
 Dr. Andrew James, University College London (UK)
 Dr. Robert Konik, Brookhaven National Laboratory (USA)
 Prof. Philippe Lecheminant, LPTM Université de Cergy-Pontoise (France)
 Dr. Isaac Pérez Castillo, Universidad Nacional Autónoma de México (México)
 Prof. Maurice Rice, ETH Zurich (Switzerland)
 Dr. Dirk Schuricht, University of Utrecht (the Netherlands)
 Dr. Alexei Tsvelik, Brookhaven National Laboratory (USA)
 Dr. Andreas Weichselbaum, Brookhaven National Laboratory (USA)
- EXPERIMENT Dr. Yue Cao, X-ray Scattering, Argonne National Laboratory (USA)
 Dr. Mark Dean, X-ray Scattering, Brookhaven National Laboratory (USA)
 Dr. Jing Tao, Electron Microscopy, Brookhaven National Laboratory (USA)

Publications

(* denotes alphabetical ordering of authors)

Letters

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|------|---------|--|
| (1)* | TITLE | <i>Prethermalization and thermalization in models with weak integrability breaking</i> |
| | AUTHORS | B. Bertini, F. H. L. Essler, S. Groha and <u>N. J. Robinson</u> |
| | JOURNAL | Phys. Rev. Lett. 115, 180601 (2015) |
| (2) | TITLE | <i>Motion of a distinguishable impurity in the Bose gas: arrested expansion without a lattice and impurity snaking</i> |
| | AUTHORS | <u>N. J. Robinson</u> , J.-S. Caux and R. M. Konik |
| | JOURNAL | Phys. Rev. Lett. 116 145302 (2016) |
| (3)* | TITLE | <i>Umklapp scattering as the origin of T-linear resistivity in the normal state of high-T_c cuprate superconductors</i> |
| | AUTHORS | T. M. Rice, <u>N. J. Robinson</u> , and A. M. Tsvelik |
| | JOURNAL | Phys. Rev. B Rapid Commun. 96, 220502 (2017) |
| (4) | TITLE | <i>Non-Topological Majorana Zero Modes in Inhomogeneous Spin Ladders</i> |
| | AUTHORS | <u>N. J. Robinson</u> , A. Altland, R. Egger, N. Gergas, W. Li, D. Schuricht, A. M. Tsvelik, A. Weichselbaum, and R. M. Konik |
| | JOURNAL | Phys. Rev. Lett. 122, 027201 (2019) |
| (5)* | TITLE | <i>Nonthermal states arising from confinement in one and two dimensions</i> |
| | AUTHORS | A. J. A. James, R. M. Konik, and <u>N. J. Robinson</u> |
| | JOURNAL | Phys. Rev. Lett. 122, 130603 (2019) |
| (6) | TITLE | <i>Quantum quench in a driven Ising chain</i> |
| | AUTHORS | E. E. Gutmán, I. Perez Castillo, and <u>N. J. Robinson</u> |
| | JOURNAL | in preparation, to be submitted to Phys. Rev. Lett. |

Articles

- (1) TITLE *Smooth electron waveguides in graphene*
AUTHORS R. R. Hartmann, **N. J. Robinson**, and M. E. Portnoi
JOURNAL [Phys. Rev. B **81**, 245431 \(2010\)](#)
- (2) TITLE *Finite wave vector pairing in doped two-leg ladders*
AUTHORS **N. J. Robinson**, F. H. L. Essler, E. Jeckelmann and A. M. Tsvelik
JOURNAL [Phys. Rev. B **85**, 195103 \(2012\)](#)
- (3)* TITLE *Quench dynamics in a model with tunable integrability breaking*
AUTHORS F. H. L. Essler, S. Kehrein, S. Manmana and **N. J. Robinson**
JOURNAL [Phys. Rev. B **89**, 165104 \(2014\)](#)
- (4) TITLE *Quasiparticle breakdown in the quasi-one-dimensional Ising ferromagnet CoNb_2O_6*
AUTHORS **N. J. Robinson**, F. H. L. Essler, I. Cabrera and R. Coldea
JOURNAL [Phys. Rev. B **90**, 174406 \(2014\)](#)
- (5) TITLE *Exact nonequilibrium dynamics of a class of initial states in one-dimensional two-component quantum gases*
AUTHORS **N. J. Robinson**, J.-S. Caux and R. M. Konik
JOURNAL [arXiv:1602.05532 \(2016\)](#)
- (6)* TITLE *Thermalization and light-cones in a model with weak integrability breaking*
AUTHORS B. Bertini, F. H. L. Essler, S. Groha and **N. J. Robinson**
JOURNAL [Phys. Rev. B **94**, 245117 \(2016\)](#)
- (7) TITLE *Excitations in the Yang-Gaudin Bose gas*
AUTHORS **N. J. Robinson** and R. M. Konik
JOURNAL [J. Stat. Mech. **2017** 063101 \(2017\)](#)
- (8) TITLE *Magnetism in artificial Ruddlesden-Popper iridates leveraged by structural distortions*
AUTHORS D. Meyers, Y. Cao, G. Fabbris, **N. J. Robinson**, L. Hao, C. Frederick, N. Traynor, J. Yang, J. Lin, M. H. Upton, D. Casa, J.-W. Kim, T. Gog, E. Karapetrova, Y. Choi, D. Haskel, P. J. Ryan, L. Horak, X. Liu, J. Liu and M. P. M. Dean
JOURNAL [Sci. Rep. **9**, 4263 \(2019\)](#)
- (9) TITLE *Ladder-like optical conductivity in the spin-fermion model*
AUTHORS L. Classen, **N. J. Robinson**, and A. M. Tsvelik
JOURNAL [Phys. Rev. B **99**, 115110 \(2019\)](#)
- (10) TITLE *Signatures of rare states and thermalization in a theory with confinement*
AUTHORS **N. J. Robinson**, A. J. A. James and R. M. Konik
JOURNAL [arXiv:1808.10782](#), under review at Phys. Rev. B
- (11) TITLE *Interaction quenches in the Lieb-Liniger model using the truncated spectrum approach*
AUTHORS **N. J. Robinson**, and J.-S. Caux
JOURNAL in preparation, to be submitted to SciPost Phys.
- (11) TITLE *Static and dynamical correlation functions in the non-integrable Ising field theory*
AUTHORS X. Verbeek, J.-S. Caux, and **N. J. Robinson**
JOURNAL in preparation, to be submitted to SciPost Phys.

Review Articles

- (1)* TITLE *Non-perturbative methodologies for low-dimensional strongly-correlated systems: From non-Abelian bosonization to truncated spectrum methods*
 AUTHORS A. J. A. James, R. M. Konik, P. Lecheminant, **N. J. Robinson**, and A. M. Tsvelik
 JOURNAL [Rep. Prog. Phys.](#) **81**, 046002 (2018)
- (2) TITLE *Anomalies in the pseudogap phase of the cuprates: A perspective on the role of umklapp scattering*
 AUTHORS **N. J. Robinson**, P. D. Johnson, T. M. Rice, and A. M. Tsvelik
 JOURNAL submitted to *Rep. Prog. Phys.* in February 2019

Other Publications

- (1) TITLE *Viewpoint in Physics: Cold atoms bear a quantum scar*
 AUTHORS **N. J. Robinson**
 JOURNAL [Physics](#) **11**, 105 (2018)

Selected Recent Presentations

TITLE	<i>Nonthermal states in nonintegrable models with confinement</i>
EVENT	Quantum Snapshots, City University of New York
DATE	March 2019
TITLE	<i>Ladder-like physics in transport phenomena of high-T_c cuprates</i>
EVENT	Utrecht University Condensed Matter Theory Seminar
DATE	January 2019
TITLE	<i>Majorana zero modes in spin ladders</i>
EVENT	UvA Quantum Matter Seminar
DATE	January 2019
TITLE	<i>Nonthermal states in theories with confinement</i>
EVENT	Monthly Institute of Physics Lunch Seminar, UvA
DATE	November 2018
TITLE	<i>Nonthermal states in theories with confinement</i>
EVENT	Condensed Matter Theory Seminar, University of Nottingham
DATE	October 2018
TITLE	<i>Nonthermal states in theories with confinement</i>
EVENT	Quantum Paths, ESI Vienna
DATE	May 2018
TITLE	<i>A tale of two fluids</i>
EVENT	UvA Quantum Matter Seminar
DATE	May 2018
TITLE	<i>Conjuring Majorana fermions in inhomogeneous ladders</i>
EVENT	UvA Condensed Matter Theory Seminar (blackboard talk)
DATE	March 2018
TITLE	<i>Truncated spectrum methods: a whistle-stop tour</i>
EVENT	UvA Master's Student Seminar Series
DATE	March 2018

TITLE	<i>Non-thermal states in the non-integrable Ising field theory</i>
EVENT	Hamiltonian methods in strongly coupled QFT, IHES Université Paris-Saclay
DATE	January 2018
TITLE	<i>An introduction to truncated spectrum methods</i>
EVENT	UCL Strongly Correlated Systems Group Meeting
DATE	November 2017
TITLE	<i>Truncated spectrum methods and non-thermal states in the Ising field theory</i>
EVENT	Triangle Meeting, Delta Institute for Theoretical Physics
DATE	November 2017
TITLE	<i>Non-thermal states in the non-integrable Ising field theory</i>
EVENT	Wonders of Broken Integrability, SCGP
DATE	October 2017
TITLE	<i>Truncated spectrum methods and non-thermal states in the Ising field theory</i>
EVENT	CCQP Seminar, Flatiron Institute, Simons Foundation NYC
DATE	September 2017
TITLE	<i>First steps towards dynamics of multi-component integrable models</i>
EVENT	Condensed Matter Physics Seminar, UCLA
DATE	May 2017
TITLE	<i>Emergent phenomena in condensed matter physics</i>
EVENT	CrossTalk Colloquium, BNL Association of Students and Postdocs
DATE	May 2017
TITLE	<i>First steps towards dynamics of multi-component integrable models</i>
EVENT	Dynamics and hydrodynamics of certain quantum matter, CUNY
DATE	March 2017
TITLE	<i>Prethermalization and thermalization in an integrability-breaking quench</i>
EVENT	Condensed Matter Theory Seminar, UvA
DATE	February 2017
TITLE	<i>Dynamics of a mobile impurity in the Bose gas</i>
EVENT	Condensed Matter Theory Seminar, Universitat Göttingen
DATE	February 2017