Francisco Leal Machado

Curriculum Vitae

Physics South Room 341
South Hall Rd, Berkeley, CA 94720
+1 (617) 682-9735
fmachado@berkeley.edu
fmachado.eu

Education

2016–Present **University of California, Berkeley**, *Berkeley, CA*, USA
PhD Candidate in Physics,
GPA – 4.0/4.0.
2018 – Master of Arts in Physics

2013–2016 **Massachusetts Institute of Technology**, *Cambridge, MA*, USA
Bachelor of Science degree in Physics,
GPA – 5.0/5.0.

2012–2013 **Universidade de Coimbra**, *Coimbra*, Portugal
Candidate for Licence in Physics,
GPA – 5.0/5.0.

Awards

2018 Outstanding Graduate Student Instructor Award
2017 Leo Falicov Fellowship
2016–2017 Physics Department Fellowship
2016 Philip Morse Memorial Award
2016 Sigma Pi Sigma Inductee
2016 Phi Beta Kappa Inductee
2015 Edward C. Pickering Award for Most Outstanding Original Project in the MIT Physics Junior Lab
2013 3% Best Students Award at the University of Coimbra
2013 Bronze Medal at the ACM SouthWestern Regional Contest
2012 Bronze Medal at the International Physics Olympiads
2012 Bronze Medal at the International Olympiads of Informatics
2012 Gold Medal at the Portuguese University Programming Marathon
2012 Third Place in the Portuguese Olympiads of Informatics
2011 Honorable Mention at the IberoAmerican Mathematics Olympiads
2011, 2012 Silver Medal at the Portuguese Mathematics Olympiads

Pre-prints

2021 Joe Randall, Conor E. Bradley, Floris van der Gronden, Asier Galicia, Mohamed H. Abobeih, Matthew Markham, Dan J. Twitchen, ***Francisco Machado***, Norman Y. Yao, Tim H. Taminiau,
Observation of a many-body-localized discrete time crystal with a programmable spin-based quantum simulator,
arXiv:2104.07678.

2021 David Wei, Antonio Rubio-Abadal, Bingtian Ye, ***Francisco Machado***, Jack Kemp, Kritsana Srakaew, Simon Hollerith, Jun Rui, Sarang Gopalakrishnan, Norman Y. Yao, Immanuel Bloch, Johannes Zeiher,
Quantum gas microscopy of Kardar-Parisi-Zhang superdiffusion,
arXiv:2107.00038.

2021 Emily J. Davis*, Bingtian Ye*, ***Francisco Machado***, Simon A. Meynell, Thomas Mittiga, William Schenken, Maxime Joos, Bryce Kobrin, Yuanqi Lyu, Dolev Bluvstein, Soonwon Choi, Chong Zu, Ania C. Bleszynski Jayich, Norman Y. Yao,
Probing many-body noise in a strongly interacting two-dimensional dipolar spin system,
arXiv:2103.12742.

Publications

2021 Chong Zu*, ***Francisco Machado***, Bingtian Ye*, Soonwon Choi, Bryce Kobrin, Thomas Mittiga, Satcher Hsieh, Prabudhya Bhattacharyya, Matthew Markham, Dan Twitchen, Andrey Jarmola, Dmitry Budker, Chris R. Laumann, Joel E. Moore, Norman Y. Yao,
Emergent hydrodynamics in a strongly interacting dipolar spin ensemble,
Nature – arXiv:2104.07678.

2021 Bingtian Ye*, ***Francisco Machado***, Norman Y. Yao,
Floquet phases of matter via classical prethermalization,
Physical Review Letters (PRL) [in press] – arXiv:2104.13927.

2021 Antonis Kyprianidis*, ***Francisco Machado***, William Morong, Patrick Becker, Kate S. Collins, Dominic V. Else, Lei Feng, Paul W. Hess, Chetan Nayak, Guido Pagano, Norman Y. Yao, Christopher Monroe,
Observation of a prethermal time crystal,
Science – arXiv:2102.01695.

2021 Rahul Sahay*, ***Francisco Machado***, Bingtian Ye*, Chris R. Laumann, Norman Y. Yao,
Emergent ergodicity at the transition between Many-Body Localized phases,
Physical Review Letters (PRL) – arXiv:2008.08585.

2020 ***Francisco Machado***, Dominic V. Else, Gregory D. Kahanamoku-Meyer, Chetan Nayak, Norman Y. Yao,
Long-range prethermal phases of nonequilibrium matter,
Physical Review X (PRX) – arXiv:1908.07530.

2020 Bingtian Ye*, ***Francisco Machado***, Christopher David White, Roger S. K. Mong, Norman Y. Yao,
Emergent hydrodynamics in Floquet quantum systems,
Physical Review Letters (PRL) – arXiv:1902.01859.

2020 Dominic V. Else, ***Francisco Machado***, Chetan Nayak, Norman Y. Yao,
An improved Lieb-Robinson bound for many-body Hamiltonians with power-law interactions,
Physical Review A (PRA) – arXiv:1809.06369.

2019 ***Francisco Machado***, Gregory D. Meyer, Dominic V. Else, Chetan Nayak, Norman Y. Yao,
Exponentially slow heating in short and long-range interacting Floquet systems,
Physical Review Research (PRR) – arXiv:1708.01620.

2019 Satcher Hsieh, Prabudhya Bhattacharyya, Chong Zu, Thomas Mittiga, Thomas J. Smart, ***Francisco Machado***, Bryce Kobrin, Tim O. Höhn, Nicholas Z. Rui, Mehdi Kamrani, Shubhayu Chatterjee, Soonwon Choi, Michael P. Zaletel, Viktor V. Struzhkin, Joel E. Moore, Valery I. Levitas, Raymond Jeanloz, Norman Y. Yao,
Imaging stress and magnetism at high pressures using a nanoscale quantum sensor,
Science – arXiv:1812.08796.

2018 Thomas Mittiga, Satcher Hsieh, Chong Zu, Bryce Kobrin, ***Francisco Machado***, Prabudhya Bhattacharyya, Nicholas Rui, Andrey Jarmola, Soonwon Choi, Dmitry Budker, Norman Y. Yao,
Imaging the local charge environment of nitrogen-vacancy centers in diamond,
Physical Review Letters (PRL) **with a viewpoint** – arXiv:1809.01668.

2017 ***Francisco Machado****, Nicholas Rivera*, Hrvoje Buljan, Marin Soljačić, Ido Kaminer,
Shaping polaritons to reshape selection rules,
ACS Photonics – arXiv:1610.01668.

2015 Paul Torrey, Sarah Wellons, ***Francisco Machado***, Brendan Griffen, Dylan Nelson, Vicente Rodriguez-Gomez, Ryan McKinnon, Annalisa Pillepich, Chung-Pei Ma, Mark Vogelsberger, Volker Springel, Lars Hernquist,
An analysis of the evolving comoving number density of galaxies in hydrodynamical simulations,
Monthly Notices of the Royal Astronomical Society (MNRAS).

* **These authors contributed equally to this work**.

Talks

2020 **Technical University of Munich - Condensed Matter Theory Seminar**, Munich, Germany.
Prethermal matter in long-range interacting systems

2020 **Ludwig Maximilian University of Munich - Group Seminar**, Munich, Germany.
Prethermal matter in long-range interacting systems

2019 **APS March Meeting**, Boston, MA.
An improved Lieb-Robinson bound for many-body Hamiltonians with power-law interactions

2018 **APS March Meeting**, Los Angeles, CA.
Prethermal phases in long-range interacting systems

2017 **Bay Area Cold Atom Meeting (BACAM)**, Berkeley, CA.
Prethermalization and time-Crystalline order in long-range interacting systems

2017 **CLEO**, San Jose, CA.
Shaping polaritons to reshape selection rules

2017 **APS March Meeting**, New Orleans, LA.
Prethermal time crystals

Posters

2020 **DAMOP - Division of Atomic Molecular & Optical Physics**, Virtual.
Observation of nanoscale hydrodynamics in a strongly interacting dipolar spin ensemble in diamond

2017 **DAMOP - Division of Atomic Molecular & Optical Physics**, Sacramento, CA.
Prethermal time crystals

2013 **International Conference on Stem Cells for Drug Screening and Regenerative Medicine**.
Following the stochastic dynamics of Nanog through a fluorescent reporter - a computational study

Summer Schools

2021 **Boulder School for Condensed Matter and Materials Physiscs**, Boulder, USA.

2019 **Les Houches Summer School on Quantum Dynamics and Disorder**, Les Houches, France.

2018 **Quantum Connections Summer School**, Stockholm, Sweden.

2015 **Novos Talentos Em Matemática - Dynamical Systems Summer School**, Lisbon, Portugal.