

**Acknowledgments
in Scientific
Publications and
Presentations** *and Posters*

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First, get it spelled correctly...

**There is no *e* following the *g* in the
U.S. English spelling of *acknowledgment***

**(Don't believe me?—look at the acknowledgment
page of any book published by a U.S. publisher)**

**British English spells it with the “*e*,” but we colonials
have our own rules**

**Some wimpy dictionaries may accord “*acknowledgement*”
alternative status, but we have higher standards in physics**

The *acknowledgment* is a formal printed statement that recognizes individuals and institutions that contributed to the work being reported

Contributions to the research should be acknowledged

Non-research contributions are generally not appropriate for acknowledgment in a scientific paper but may be in a thesis

Acknowledge research contributions by people other than the authors

Persons who gave scientific guidance, participated in discussions, or shared unpublished results

Persons who provided samples or equipment

Assistants who helped do the work

Technicians at user facilities or labs

Make it a simple statement of thanks, not a testimonial or dedication

Do not acknowledge non-science contributors

**Persons who helped prepare the manuscript
(e.g., typists, graphic artists)**

**Persons who provided encouragement or
moral support (e.g., Mom)**

**Persons who provided non-technical services
(e.g., grant coordinators, secretaries,
purchasing agents)**

**These individuals might be acknowledged in a
thesis, but not in a journal article, presentation,
or poster**

Acknowledge by name only

**Do not use titles, honorifics, positions, or
awards**

Paul G. Kwiat

NOT

**Professor Paul G. Kwiat,
Bardeen Chair in Physics**

Anthony J. Leggett

NOT

Sir Dr. A.J. Leggett, Nobel Laureate

Always acknowledge financial support of the research—always

Give the name of the funding agency and grant or contract number

Do not mention any title that came with the funds

A.C. acknowledges support from the Lorella Jones Summer Research Fund

NOT

A.C. was a Lorella Jones Summer Research Fellow

Funding agency acknowledgments

An acknowledgment of NSF support and a disclaimer must appear in publications (including World Wide Web sites) of any material, whether copyrighted or not, based on or developed under NSF-supported projects

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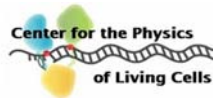
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Where to put the acknowledgments?

Temperature-Dependent Fliprate of Artificial Spin Ice
 Isaac Carrasquillo, Yuyang Lao, and Peter Schiffer
 Department of Physics, University of Illinois at Urbana-Champaign

Goal
Find a model for the flipping behavior of artificial spin ice at varying temperatures.

Artificial Spin Ice

- Identically fabricated nanometer scale, single domain island arrays used to analyze magnetic fluctuations.
- Dimensions: 170 nm by 470 nm with a thickness of 3 nm.
- Composed of permalloy, an 80% iron and 20% nickel alloy.

Tetris Lattice

- Similar to square lattice with 3/8 of the islands removed.
- Used to study the one-dimensional Ising Model of the spinwave islands.
- Islands behave differently based on how many nearest neighbors exist.

Photoemission Electron Microscopy

- Record electrons emitted from a sample in response to the absorption of incoming radiation.
- Extract the relative direction of the magnetization of each island with respect to the incoming X-ray.
- The islands appear black or white depending on the direction of island's magnetization.
- Imaged 520 frames of it in the temperature range from 500 K to 540 K.

Active Island Model

Master Carlo Simulation

- Active islands flip during exposure time, in each frame.
- Matches an average over time with an average over space, experimental data.
- The time scale, 0.1-1000ns, represents the behavior of one island.
- Random flip, δT_{ij} , distributed and biased using τ_{ij} random sampling.

Self Relaxation Theory

- Determine the mean transition time between energy states for various temperatures.
- Dependent on energy barrier, KV between two spin states and attempt period, τ_0 .
- Describe a free spin wave number of a superparamagnetic material.

$$\frac{1}{\tau(T)} = \tau_0(T) = \tau_0(e^{KV/T})$$

Fits to Fliprate Model

- The horizontal fliprate is the first to become active, followed by vertical, vertical, and horizontal.
- Islands with more nearest neighbors flipped at higher T.

- Energy barriers were between 0.27 eV and 0.38 eV.
- Different periods were between: $0.04-0.07$ ns and $1.1-1.3$ ns.
- Energy barriers were higher for islands that were flipped at higher T.

Future Work

- Applying this same analysis to pentagonal and Sierpinski lattices.
- Use lower thermal temperatures to get more accurate data.
- Improving the model by include external influences.

Acknowledgments

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An alternative placement

Machine Learning and Cosmological Simulations
Harshi M. Kamdar, Matthew J. Turk, Robert J. Brunner
University of Illinois at Urbana-Champaign

Introduction & Motivations

- What is the influence of dark matter (DM) structure on galaxy evolution?
- Can we study this relationship by using machine learning (ML)?
- Current galaxy formation techniques are expensive to run, however, dark matter only simulations are not.
- ML offers a solid framework to mine hydrodynamical simulations for more robust, computational efficiency, relative simplicity, and ability to learn highly complex relationships.

Simulating a Simulation?

- ML algorithms proposed in our previous work were randomized trees and random forests.
- The ML algorithms are trained on the Dark Sky simulation (dark matter) and applied to the Dark Sky simulation (dark matter).

Lighting up Dark Sky

Conclusions

- The ML simulated galaxies in the Dark Sky simulation are numerically, physically, and statistically robust.
- However, the ML simulated galaxies abide by certain fundamental observational constraints, further adding confidence in our approach.
- ML techniques approximated, more, a full-blown hydrodynamical simulation inside a DM only simulation only on orders of magnitude faster.

Future Work

- Creating full mock galaxy catalogs using ML, with different cosmological parameters to compare with observations in the future of minutes.
- Comparing different hydrodynamical simulation codes to see how different the used parameters and excitation techniques affect structure formation in a hydrodynamical simulation.

References

- Kamdar H, Turk M, Brunner R, 2019a MNRAS (Accepted)
- Kamdar H, Turk M, Brunner R, 2019b MNRAS (Submitted)
- Kamdar H, Turk M, Brunner R, 2019c MNRAS (in press)

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To Recap:

- Get it spelled correctly
- Acknowledge people who contributed to the scientific work but are not co-authors
- Keep it a simple expression of thanks, not a testimonial
- Acknowledge the use of special facilities
- ALWAYS** acknowledge financial support;
- conform to funder guidelines for language
- Check with the funder about use of logos



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