Cristiano Nisoli

Theoretical Division–CNLS
Mail Stop B262
Los Alamos National Laboratory
Los Alamos NM USA 87545

Tech Area 03, Bldg 1690, Ofc 115
Fax: 1-505-665-2659
Phone: 1-505-664-0154
Email: cristiano@lanl.gov

NATIONALITY Italian.

EMPLOYMENT

Director Funded Fellow — Los Alamos National Laboratory
Los Alamos, NM — Since November 2008

CNLS Postdoctoral Research Associate — Los Alamos National Laboratory
Los Alamos, NM — August 2008-November 2008

Post Doctoral Scholar — Penn State University
University Park, PA — June 2007 – June2008

EDUCATION

Ph.D. in Physics, 2007; GPA: 3.94/4.00
Advisor: Prof. Vincent H. Crespi
Penn State University, University Park, PA.

Laurea in Fisica 2000; Final Grade 110/110
Advisors: Prof. Giovanni Prosperi, Prof. Daniela Zanon
Università degli Studi di Milano, Milan, Italy.

PUBLICITY

- Dynamical Phyllotaxis featured in *Nature Materials* News and Views, Philip Ball, *Nature Materials* **9**, 470 (2010).
- Dynamical Phyllotaxis featured in column of the American Mathematical Society. (http://www.ams.org/samplings/feature-column/fcarc-phyllotaxis).
- Dynamical Phyllotaxis featured in Los Alamos PADSTE Highlights June 3, 2009.
- Dynamical Phyllotaxis featured in PhysOrg (http://www.physorg.com/news162035121.html) and others physics websites.
- Artificial Spin Ice featured in *Nature Physics* News and Views, Andreas Trabesinger, *Nature Physics* **4**, 832 (2008).
- Artificial Spin Ice featured in *Nature* News and Views, Steven T. Bramwell, *Nature* **439**, 273 (2006).
- Artificial Spin Ice featured in *Nature* Editor Summary, *Nature* **439** (2006).
- Artificial Spin Ice featured in PhysOrg (http://www.physorg.com/news9998.html) (2006) and others physics websites.
- Artificial Spin Ice featured on the cover of *Nature* (2006).

HONORS, AWARDS

- 2010: Outstanding Poster Award, Postdoc Research Day, Los Alamos National Laboratory.
- 2010: Leon Heller Prize for Theoretical Physics, 2^{nd}, Los Alamos National Laboratory.
- 2008: Director funded fellowship, Los Alamos National Laboratory.
- 2006: Duncan fellowship, Penn State.
- 2005: Duncan fellowship, Penn State.

Invited Talks

17. "Rotons and Solitons in a Magnetic Cactus: Dynamical Phyllotaxis"
Department of Physics
University of California San Diego, La Jolla CA
September 2010

16. "DNA under tension and torque: An Helical, Analytical Solvable Model."
Department of Physics
Penn State University, University Park, PA
September 2010

15. "Effective Temperature in an Interacting, Externally Driven, Vertex System: Theory and Experiment on Artificial Spin Ice."
2^{nd} Bragg-Stoner Symposium
School of Physics and Astronomy, University of Leeds, Leeds, UK
July 2010

14. "Thermally Induced Local Failures in Quasi-One-Dimensional Systems: Collapse in Carbon Nanotubes, Necking in Nanowires and Opening of Bubbles in DNA"
Dipartimento Scienze dei Materiali
Università degli Studi di Milano, Milan, Italy
March 2010

13. "Effective Temperature in an Interacting, Externally Driven, Vertex System: Theory and Experiment on Artificial Spin Ice"
Abteilung Kondensierte Materie
Max-Planck-Institut für Physik komplexer Systeme, Dresden, Germany
March 2010

12. "Rotons and Solitons in a Magnetic Cactus: Dynamical Phyllotaxis"
Abteilung Biologische Physik
Max-Planck-Institut für Physik komplexer Systeme, Dresden, Germany
March 2010

11. "Thermally Induced Local Failures in Quasi-One-Dimensional Systems: Collapse in Carbon Nanotubes, Necking in Nanowires and Opening of Bubbles in DNA"
Peierls Centre for Theoretical Physics
University of Oxford, Oxford, UK
February 2010

10. "Carbon Nanostructures as Electromechanical Bicontinuum"
T-4, Theoretical Division
Los Alamos National Laboratory, Los Alamos, NM
July 2009

9. "Thermal Stability of Strained Nanowires"
Center for Nonlinear Studies External Advisory Committee Meeting
Los Alamos National Laboratory, Los Alamos, NM
February 2009

8. "Frustrated Yet Excited: The Magic Adventures of a Magnetic Cactus in the Enchanted Land of Dynamical Phyllotaxis"
Arizona State University, Tempe, AZ
January 2009

7. "Rotons and Solitons in a Magnetic Cactus: Dynamical Phyllotaxis"
Center for Nonlinear Studies
Los Alamos National Laboratory, Los Alamos, NM
September 2008

6. "Carbon Nanostructures as Electromechanical Bicontinuum"
Dipartimento Scienze dei Materiali
Università degli Studi di Milano, Milan, Italy
July 2008

5. "Frustration, Disorder, Jamming and Effective Thermodynamics in Artificial Spin Ice"
   Center for Nonlinear Studies
   Los Alamos National Laboratory, Los Alamos, NM
   November 2007
4. "Carbon Nanostructures as an Electromechanical Bicontinuum"
   Physics Department
   Cornell University, Ithaca, NY
   June 2007
3. "Optical and Electromechanical Properties of Graphene and Carbon Nanotubes via a Two-Field Elastic Formalism"
   Mindlin Symposium, 15^{th} U.S. National Congress on Theoretical and Applied Mechanics
   University of Colorado Boulder, Boulder, CO
   June 2006
2. "Phyllotaxis in a Wigner Crystal"
   Workshop on Application of Density-Functional Theory in Condensed-Matter
   Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin, Germany
   July 2003
1. "Energetics of Point Dipoles on a Thin Cylinder: a Remarkable Forest of Rational Fractions" *MRSEC*
   Physics Department, Penn State University, University Park, PA
   July 2001

Also, several contributed talks at APS March Meetings (2003, 2004, 2005, 2007, 2009, 2010).

PROFESSIONAL ACTIVITIES.

- Referee for Physical Review Letters, Physical Review B, Physical Review E.
- Member of the CNLS Colloquium Committee.
- Advised Los Alamos Summer School student, Zachary Slepian (Princeton).

COLLABORATORS

- V. H. Crespi, P. Schiffer, P. Lammert, Jie Li at Penn State University
- D. Abraham at Oxford University
- X. Ke at Oak Ridge National Laboratory
- N. Gabor at Cornell University
- A. Saxena and T. Lookman at Los Alamos National Laboratory

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PUBLICATIONS

20. J. Li, S. Zhang, J. Bartell, C. Nisoli, X. Ke, P. E. Lammert, V. H. Crespi, and P. Schiffer
"Comparing Frustrated and Unfrustrated Clusters of Single-Domain Ferromagnetic Islands"
Phys. Rev. B **82** 134407 (2010)

19. C. Nisoli, Jie Li, X. Ke, D. Garand, P. Schiffer, V. H. Crespi
"Effective Temperature in an Interacting Vertex System: Theory and Experiment on Artificial Spin Ice"
Phys. Rev. Lett. **105** 047205 (2010)†

18. A. K. Gupta, C. Nisoli, P. Lammert, V. H. Crespi and P. C. Eklund
"Curvature-Induced D-Band Raman Scattering in Folded Graphene"
J. Phys. Cond. Matt. **22** 334205 (2010)

17. P. E. Lammert , X. Ke, J. Li , C. Nisoli , D. M. Garand , V. H. Crespi and P. Schiffer
"Direct Entropy Determination and Application to Articial Spin Ice"
Nature Phys. **6** 786 (2010)†

16. C. Nisoli, N. M. Gabor, P. E. Lammert, J. D. Maynard, and V. H. Crespi
"Annealing a Magnetic Cactus into Phyllotaxis"
Phys. Rev. E **81** 046107 (2010)†

15. J. Li, X. Ke, S. Zhang, D. Garand, C. Nisoli, P. Lammert, V. H. Crespi, and P. Schiffer
"Comparing Artificial Frustrated Magnets by Tuning the Symmetry of Nanoscale Permalloy Arrays"
Phys. Rev. B **81** 092406 (2010)

14. C. Nisoli, D. Abraham, T. Lookman, and A. Saxena
"Thermally Induced Local Failures in Quasi-One-Dimensional Systems: Collapse in Carbon Nanotubes, Necking in Nanowires, and Opening of Bubbles in DNA"
Phys. Rev. Lett. **104**119902 (2010)†

13. C. Nisoli
"Dynamical Phyllotaxis, Artificial Spin Ice, and Graphenic Bicontinuum"
ISBN 978-3-639-19748-8, VDM Verlag (2009)

12. C. Nisoli
"Polarons Induced Deformations in Carbon Nanotubes"
Phys. Rev. B **80** 113406 (2009)†

11. C. Nisoli
"Spiraling Solitons. A Continuum Model for Dynamical Phyllotaxis and of Physical Systems"
Phys. Rev. E **80** 026110 (2009)‡

10. C. Nisoli, D. Abraham, T. Lookman, and A. Saxena
"Thermal Stability of Strained Nanowires"
Phys. Rev. Lett. **102** 245504 (2009)†

9. C. Nisoli, N. M. Gabor, P. E. Lammert, J. D. Maynard, and V. H. Crespi
"Static and Dynamical Phyllotaxis in a Magnetic Cactus"
Phys. Rev. Lett. **102** 186103 (2009)†

8. X. Ke, J. Li, S. Zhang, C. Nisoli, V. H. Crespi, and P. Schiffer
"Tuning Magnetic Frustration of Nanomagnets in Triangular-Lattice Geometry "
Appl. Phys. Lett. **93** 252504 (2008)†

7. X. Ke, J. Li, C. Nisoli, P. E. Lammert, W. McConville, R. F. Wang, V. H. Crespi, and P. Schiffer
"Energy Minimization and AC Demagnetization in a Nanomagnet Array"
Phys. Rev. Lett. **101** 037205 (2008)†

6. C. Nisoli, E. Mockenstrum, P. E. Lammert, V. H. Crespi
"Carbon Nanostructures as an Electromechanical Bicontinuum"
Phys. Rev. Lett. **99** 045501 (2007)†

5. C. Nisoli, R. Wang, W. McConville, P. E. Lammert, P. Schiffer and V. H. Crespi
"Ground State Lost, Degeneracy Found: The Effective Thermodynamics of Artificial Spin Ice"
Phys. Rev. Lett. **98**, 217203 (2007)†

4. R. Wang, C. Nisoli, R. S. Freitas, J. Li, W. McConville, B. Cooley, M. S. Lund, N. Samarth, C. Leighton, V. H. Crespi and P. Schiffer
"Artificial 'Spin Ice' in a Geometrically Frustrated Lattice of Nanoscale Ferromagnetic Islands: Addendum"
Nature **446** 102 (2007)

3. R. F. Wang, J. Li, W. McConville, C. Nisoli, X. Ke, J. W. Freeland, V. Rose, M. Grimsditsch, P. Lammert, V. H. Crespi and P. Schiffer
"Demagnetization Protocols for Frustrated Interacting Nanomagnet Arrays"
J. Appl. Phys. **101**, 09J104 (2007)

2. R. Wang, C. Nisoli, R. S. Freitas, J. Li, W. McConville, B. Cooley, M. S. Lund, N. Samarth, C. Leighton, V. H. Crespi and P. Schiffer
"Artificial 'spin ice' in a Geometrically Frustrated Lattice of Nanoscale Ferromagnetic Islands"
Nature **439** 303 (2006)

1. G. Chen, S. Bandow, E. R. Margine, C. Nisoli, A. Kolmogorov, V. H. Crespi, R. Gupta, G. Sumanasekera, S. Iijima and P. Eklund
"Chemically Doped Double-Walled Carbon Nanotubes: Cylindrical Molecular Capacitors"
Phys. Rev. Lett. **90**, 257403 (2003)†

† Selected by the Virtual Journal of Nanoscale Science & Technology.
‡ Selected by the Virtual Journal of Biological Physics Research.

Cristiano Nisoli

PRIMARY REFERENCES

Vincent H. Crespi
Physics Department
Pennsylvania State University
104 Davey Lab, #193
University Park, PA 16802-6300
Phone: (814) 863-0163
Fax: (814) 865-3604
crespi@phys.psu.edu
Professor of Physics and Downsbrough Professor
Professor of Materials Science and Engineering
Associate Director of Penn State MRSEC

Douglas Abraham
Rudolf Peierls Centre for Theoretical Physics
Oxford University
1 Keble Road,
Oxford, OX1 3NP England
Phone: ++44 (0)1865 273969
d.abraham1@physics.ox.ac.uk
Professor of Physics.

Avadh Saxena
Theoretical Division
Los Alamos National Laboratory
Los Alamos, NM, 87545
Phone: (505) 667 5227
avadh@lanl.gov
T-4 Group Leader

Peter E. Schiffer
Physics Department
Pennsylvania State University
104 Davey Lab, #135
University Park, PA 16802-6300
Phone: (814) 865-5982
Fax: (814) 865-3604
schiffer@phys.psu.edu
pes12@psu.edu
Professor of Physics
Associate Vice President for Research, Penn State
Director of Strategic Initiatives

Additional References

Gerald Mahan
Physics Department
Pennsylvania State University
104 Davey Lab, # 169
University Park, PA 16802-6300
Phone: (814) 865-6092
Fax: (814) 865-3604
gdm12@.psu.edu
gmahan@psu.edu
Distinguished Professor of Physics

Robert E. Ecke
CNLS
Los Alamos National Laboratory
Los Alamos, NM, 87545
Phone: (505) 667 6733
ecke@lanl.gov
CNLS Director
Lab Fellow

Turab Lookman
Theoretical Division
Los Alamos National Laboratory
Los Alamos, NM, 87545
Phone: (505) 665 0419
txl@lanl.gov
T-4 Scientist

Charles Reichhardt
Theoretical Division
Los Alamos National Laboratory
Los Alamos, NM, 87545
Phone: (505) 667 9958
charlesr@cnls.lanl.gov
T-4 Scientist