

## Olle Heinonen

### Education

Institute of Technology, Uppsala University	M.Sc.	1982	Engineering Physics
Case Western Reserve University, Cleveland	M.S.	1985	Physics
Case Western Reserve University, Cleveland	Ph.D.	1985	Physics
University of California, Santa Barbara	Physics	1985-87	Post-doc
Case Western Reserve University	Physics	1987-89	Post-doc

### Appointments

2014 – present, Fellow, Computation Institute, University of Chicago  
2013 – present Fellow, Northwestern-Argonne Institute of Science and Engineering  
2010 – present Material Scientist, Argonne National Laboratory.  
2010 – 2016 Adjunct Professor of Physics, Northwestern University  
1998 – 2010 Engineer/Manager at Seagate Technology.  
1993 – 1998 Associate Professor of Physics (with tenure), University of Central Florida.  
1989 – 1993 Assistant Professor of Physics, University of Central Florida  
1987 – 1989 Post-doctoral research associate, Case Western Reserve University  
1985 – 1987 Post-doctoral research associate, University of California, Santa Barbara

### Honors

Fellow, American Physical Society (2014)

### Ten publications (out of > 100):

1. J. Mangeri, Y. Espinal, A.M. Jokisaari, S.P. Alpay, S. Nakhmanson, and O. Heinonen, “Topological phase transformations and intrinsic size effects in ferroelectric nanoparticles”, *Nanoscale* **9**, 1616 (2017)
2. W. Jiang, X. Zhang, G. Yu, W. Zhang, M. B. Jungfleisch, J. E. Pearson, O. Heinonen, K.L. Wang, Y. Zhou, A. Hoffmann, S. G. E. te Velthuis, “Direct Observation of the Skyrmion Hall Effect”, *Nature Physics* **13**, 162 (2017).
3. C. Phatak, O. Heinonen, M. de Graef, and A. Petford-Long, “Nanoscale skyrmions in a non-chiral metallic multiferroic: Ni<sub>2</sub>MnGa”, *Nano Letters* **16**, 4141 (2016).
4. E. Iacocca, S. Gliga, R.L. Stamps, and O. Heinonen, “Reconfigurable spin wave band structure of artificial square spin ice”, *Phys. Rev. B* **93**, 134420 (2016).
5. X. Zhong, I. Rungger, P. Zapol, H. Nakamura, Y. Asai, and O. Heinonen, “The effect of Ta ‘oxygen scavenger layer’ on HfO<sub>2</sub>-based resistive switching behavior: thermodynamic stability, electronic structure, and low-bias transport”, *Phys. Chem. Chem. Phys.* **18**, 7502 (2016).
6. W. Jiang, P. Upadhyaya, W. Zhang, G. Yu, M. B. Jungfleisch, F. Y. Fradin, J. E. Pearson, Y. Tserkovnyak, K. L. Wang, O. Heinonen, S. G. E. te Velthuis, and A. Hoffmann, “Blowing Magnetic Skyrmion Bubbles”, *Science* **349**, 283 (2015).
7. M.J. Welland, O. Heinonen, D. Karpoyev, and D.T. O’Connor, “Miscibility gap closure, interface morphology, and phase microstructure of 3D Li<sub>x</sub>FePO<sub>4</sub> nanoparticles from surface wetting and coherency strain”, *ACS Nano* **9**, 9757 (2015).

8. S. Gliga, A. Kakay, R. Hertel, and O.G. Heinonen, “Spectral analysis of topological defects in an artificial spin-ice lattice”, *Phys. Rev. Lett.* **110**, 117205 (2013).
9. P.K. Muduli, O. Heinonen, and J. Åkerman, “Decoherence and mode-hopping in a magnetic tunnel junction based spin torque oscillator”, *Phys. Rev. Lett.* **108**, 207203 (2012).
10. C. Phatak, A.K. Petford-Long, and O. Heinonen, “Direct observation of unconventional topological spin structure in coupled magnetic discs”, *Phys. Rev. Lett.* **108**, 067205 (2012).

### **Books**

1. Many-Particle Theory, E.K.U. Gross, E. Runge and O. Heinonen, (433 pages, IOP Publishing, Bristol, 1991)
2. Composite Fermions, O. Heinonen (editor), 491 pages, World Scientific, Singapore, 1998
3. A Quantum Approach to Condensed Matter, Philip L. Taylor and O. Heinonen (Cambridge University Press, 2002)
4. Novel Materials and Devices for Spintronics, S. Sanvito, O. Heinonen, V.A. Dediu, and N. Rizzo (editors) (Materials Research Society Symposium Proceedings 1183, 2009).

### **Patents**

36 US Patents

### **Synergistic Activities**

- Member APS/GMAG Executive Committee 2010 – 2012,
- Member, IEEE MagSoc AdCom 2008 – 2010
- Editorial Board, *Journal of Magnetism and Magnetic Materials*, 2006 -2008.
- Program co-chair *10<sup>th</sup> Joint MMM/Intermag Conference*, 2007, Baltimore
- Symposium organizer *Novel Materials and Devices for Spintronics*, MRS Spring Meeting, 2009, San Francisco

**Ph.D. Thesis Advisor:** Philip Taylor, Case Western Reserve University

**Post-doctoral advisors:** Walter Kohn, UCSB (deceased); Philip Taylor, Case Western Reserve University