CV

Name:	**Randi Holmestad.**
Date of birth:	19. October, 1967.
Nationality:	Norwegian.
Present position:	Professor, Dept of Physics, NTNU Scientific Adviser, SINTEF Materials and Chemistry
Marital status:	Married, two children.
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Research interests

Holmestad's present research interests are focussed on materials physics; transmission electron diffraction and microscopy (TEM), materials microstructure and the relation to macroscopic properties. Ongoing projects are on quantitative electron diffraction, aluminium alloys, hydrogen storage materials, solar cell materials, thermoelectric materials and new functional materials.

Education

'Sivilingeniør' (MSc) in Materials Physics, Norwegian Institute of Technology (NTH), University of Trondheim. 1991, Final Mark: 1.6 ('Very Good'). Diploma Thesis: "TEM-examinations of a Precipitation Sequence in an AlMgZn Alloy"

'Doktor Ingeniør' (PhD), Dept. of Physics, NTH, 1994. Title of thesis: "Quantitative Electron diffraction. Energy filtering and studies of bonding effects in TiAl."
Mark : 1.0. ("Outstanding")

Pedagogical Education (PUFS), 1992. Average mark: 2.2

Experience

Scientific Assistant, Dept. of Physics, NTH (1991)
Postdoc, Dept. of Physics (TEM group) NTH (1994 - 1995)
Researcher, SINTEF Materials Technology, Applied Physics (1995 –1996)
Postdoc (NFR) 'Electronic structure of intermetallic alloys', NTNU, ASU and MPI (1996-1999)
Professor, Dept. of physics, NTNU (1999 -
Scientific adviser, SINTEF Materials and Chemistry (2001-

Visiting appointments

1993: 6 months stay at Arizona State University (ASU) visiting Prof. John Spence, working with Drs. Jian Min Zuo and Andreas Weickenmeier.
1995: 2 weeks at Max Planck Institute (MPI) in Stuttgart, Germany, March, in Professor Manfred Rühle's group, visiting Dr. Andreas Weickenmeier.
1996: 4 weeks stay at MPI in Stuttgart, Nov., as a part of the Postdoc study.
1997: 6 months stay at ASU, Feb.-Aug. as a part of the Postdoc study.
2005: 6 months sabbatical at University of Illinois (UIUC), visiting Prof. Jian Min Zuo.
2006: 1 months stay at UIUC

Scientific publications and lectures

~ 50 articles in per-reviewed scientific journals

~75 articles in conference proceedings (posters/presentations) (~half international)

8 technical reports, 3 invited talks at international conferences

Professional memberships:
Norwegian Academy of Technological Sciences, Norwegian Physical Society, Electron Microscopy Society of America, European Microscopy Society, Scandinavian Society for Electron Microscopy, Materials Research Society.

International contacts:
Arizona State University, USA: Regent's Prof. John Spence (QCBED bonding charge density)
University of Illinois, Urbana-Champaign, USA, Assoc. Prof. Jian Min Zuo (QCBED)
Paul-Scherrer Institute, Switzerland: Dr. Peter Derlet (atomistic modelling)
TU Delft, Netherlands: Prof. Henny Zandbergen, Dr. Jouk Jansen (HREM; quant. diffraction)
McMaster University, Ontario, Canada: Assoc. Prof. Gianluigi Botton, Dr. Carmen Andrei (EELS; hydrogen storage materials)
Rouen University/CNRS, France: Dr. Frederic Danoix, Prof. Williams Lefebvre (atom probe)
Toyama University, Japan: Prof. Kenji Matsuda (Aluminium)
Poitiers University, France: Jerome Pacaud (QCBED)

Project management
Project leader, *Quantitative convergent beam electron diffraction* (135270/V30) (1.4 MNOK in total, 2000-2003)
Project leader SUP *Micro and nanostructural materials development* (140553/130) (12.1 MNOK in total, 2001-2006)
Steering committee; KMB *Heat treatment fundamentals*, NorLight (143877/213) (19.4 MNOK in total over 6 years, 2001-2007)
Project leader NTNU (Hydro Al Project leader), BIA *Nucleation control for optimised properties* (58 MNOK in total, 2007-2012)
Project leader, FRINAT project, *Fundamental investigations of solute clustering and nucleation of precipitation (*177600/V30) (11.7 MNOK in total, 2007-2011)
Leader of TEM Gemini Centre (SINTEF, NTNU) 2006, 2008
Organised the Nordic network (NorFA) for material research 1994-97, and main organiser of a workshop in Quantitative Electron Diffraction with 20 participants in Trondheim in June 95.
Organised a Diffraction Workshop with international participation in Trondheim in May 2008.

Teaching/Supervision experience
Teaching several courses in physics, and organising laboratory training at NTNU
Total number of students educated: 25 diploma/Master students, 7 Dr.ing (2 co-supervised), see list at end. Currently the main supervisor for 5 PhD students.

Prizes/Awards
Poster Prize at SCANDEM in 1991 and 1993.
'Esso forskerpris' 1994; for best Dr.ing. in basic research at NTH in 1994.
NIFs (Norsk Sivilingeniøres forbund) prize for young scientist in 1996.
Supervisor for Anders Frøseth who got 'Esso forskerpris' in 2003.

Committees and boards
External evaluator for ASU (1), PhD. evaluation committees, UiO (1), NTNU (3)
Prof. II evaluation committees, NTNU (3), Ass. Professor evaluation committee, UiO (1)
Board member Dept. of Physics, NTNU (1999-2001)
Member, reference group on Materials Technology, NFR (1999-2000)
Board member Scandinavian Society of Electron microscopy (SCANDEM) (2003 -)
Board member UNINETT Sigma, for high performance computing, Norway (2004-2008).
Advisory board for Dept. of Physics, NTNU (2006-)

Referee
Referee of papers for *Acta Crysallographicat, Materials Research and Technique, Scanning Microscopy Supplements* and *Institute of Physics conference series, Journal of physical Chemistry, Ultramicroscopy, Journal of Applied Crystallography….*

List of educated PhD candidates
- Christophe Birkeland (1997) *Quantitative methods in electron diffraction and microscopy* (co-supervisor with Ragnvald Høier)
- Knut Lie (2000) *Experimental and ab initio Transmission EELS Near edge fine Structure* (co-supervisor, with Ragnvald Høier)
- Anders Frøseth (2003) *Atomistic/electronic modelling of precipitation phases in Al-Mg-Si alloys* (took over from Ragnvald Høier)
- Jesper Friis (2003) *Quantitative Convergent Bean Electron Diffraction and Charge density Studies*
- Carmen Andrei (2004) *Electron microscopy studies of Materials used for hydrogen storage*
- Per Erik Vullum (2005) *Ferroelastic LaCoO3-based Polycrystalline Ceramics. A Transmission Electron Microscopy and X-ray Diffraction Study*
- Håkon K. Hasting (2006) *Clustering and precipitation in 6xxx Al alloys, TEM and APT studies*
- Heidi Nordmark (planned 2008) *Silicon solar cells –trace elements and hydrogen implantation*
- Wakshum Mekonnen Tucho (planned 2008) *Hydrogen permeable palladium based membranes*
- Ragnhild Sæterli (planned 2010) *Electronic structure of thermoelectric materials*
- Ruben Bjørge (planned 2011) *Aluminium Alloys*
- Malin Torsæter (planned 2011) *Aluminium Alloys*

List of selected journal publications for the last 5 years

Friis J, Madsen GKH, Larsen FK, Jiang B, Marthinsen K, Holmestad R Magnesium: Comparison of density functional theory calculations with electron and x-ray diffraction experiments, *Journal of Chem. Phys.* 119, 2003, 11359-11366

Friis, J., Jiang, B., Spence, J.C.H., and Holmestad, R.: Quantitative Convergent Beam Electron Diffraction Measurements of Low-Order Structure Factors in Copper. *Microscopy and Microanalysis* 9: 379-389. 2003.

Frøseth, A., Holmestad, R., Derlet, P. and Marthinsen, K. Improved tight-binding parametrization for the simulation of stacking faults in aluminum. *Phys.Rev. B* 68, 012105 (2003)

Jiang B, Friis J, Holmestad R, Zuo JM, O'Keeffe M, Spence JCH: Electron density and implication for bonding in Cu, *Phys.Rev. B* 69, Art. No. 245110, 2004.

Friis J, Jiang B, Spence J, Marthinsen K, Holmestad R : Extinction-free electron diffraction refinement of bonding in $SrTiO_3$, *Acta Cryst.* A60, 402-408, 2004.

Friis J, Jiang B, Marthinsen K, Holmestad R , A study of charge density in copper, *Acta Cryst. A* 61, 223-230, 2005.
Faaland S, Grande T, Einarsrud MA, Vullum PE, Holmestad R , Stress-strain behavior during compression of polycrystalline La1-xCaCoO3 ceramics, *Journ. Am. Ceramic Soc.* 88, 726-730, 2005.

Andrei CM, Walmsley JC, Brinks HW, Holmestad R, Srinivasan, SS, Jensen CM, and Hauback BC Electron microscopy studies of $NaAlH_4$ with TiF_3 additive: Hydrogen Cycling Effects, *Applied Physics A*, 80. 709-715, 2005.

Andrei CM, Walmsley JC, Brinks HW, Holmestad R, Blanchard D, Hauback BC, Botton GA Analytical electron microscopy studies of lithium aluminum hydrides with Ti- and V-based additives, *Journ. Phys. Chem.B* 109, 4350, 2005.

A.T.J. van Helvoort, Ø. Dahl, B.G. Soleim, R. Holmestad and T. Tybell, Imaging of out-of-plane interfacial strain in epitaxial $PbTiO_3/SrTiO_3$ thin films, *Applied Physics Letter*, 86, Art. No. 092907, 2005.

Marioara CD, Andersen S.J, Zandbergen HW and Holmestad R, The Influence of alloy composition on precipitates of the Al-Mg-Si system, *Met. Mater. Trans. A*,. 36A, 691-702, 2005.

Wærnhus I, Vullum PE, Holmestad R, Grande, T, Wiik, K, Electronic properties of polycrystalline $LaFeO_3$. Part I: Experimental results and the qualitative role of Schottky defects, *Solid State Ionics*, 176, 2783-2790, 2005

C. D. Marioara, H. Nordmark, S. J. Andersen and R. Holmestad, Post-beta" phases and their influence on microstructure and hardness in 6xxx Al-Mg-Si alloys, *Journal of Materials Science*, 41, 471-478, 2006.

Sandberg N and Holmestad R, First principles calculation of impurity diffusion barriers in Al, *Phys.Rev. B*, 73, Art. No. 014108, 2006

Vullum PE, Mastin J, Wright J, Einarsrud MA, Holmestad R, Grande T, In situ synchrotron X-ray diffraction of ferroelastic $La_{0.8}Ca_{0.2}CoO_3$ ceramics during uniaxial compression, *Acta Materialia* 54, 2615–2624, 2006.

Lein HL, Andersen OS, Vullum PE, Lara-Curzio E, Holmestad R, Einarsrud MA, Grande T Mechanical properties of mixed conducting La0.5Sr0.5Fe1-xCoxO3-delta materials, *Journal of solid State electrochemistry*, 10, 635-642, 2006

Arstad B, Venvik, H, Klette H, Walmsley JC, Tucho WM, Holmestad R, Holmen A and Bredesen R Studies of self-supported Pd- Ag membranes during and after hydrogen production in a reactor, *Catalysis today*, 118, 63-72, 2006

Hasting HS, Walmsley JC, van Helvoort ATJ, Marioara, CD, Andersen S, Holmestad R. Z-contrast imaging of the arrangement of Cu-precipitates in 6xxx-series aluminium alloys, *Philosophical Magazine Letters*, 86, 589-597, 2006

Nordmark H, Ulyashin A, Walmsley JC, Totdal B, Holmestad R Evolution of hydrogen induced defects during annealing of plasma treated Czochralski silicon *Nuclear instr. & methods in Phys. Res.*, 253, 176-181, 2006.

H. K. Hasting W. Lefebvre, C. Marioara, J. Walmsley, S. Andersen, R.Holmestad, F. Danoix, Comparative study of β''in 6xxx Al-alloy with Atom probe and HRTEM, *Surface and Interface Analysis*, 39, 189-194, 2007.

Wang G, Sæterli R, Rørvik PM, van Helvoort ATJ, Holmestad R, Grande T and Einarsrud MA. Hierarchical nanostructures of $PbTiO_3$ through mesocrystal formation, *Journal of Nanosci & Nanotech*, 7, 2538–2541, 2007.

Marioara, CD, Andersen SJ, Stene TN, Hasting H, Walmsley JC, van Helvoort ATJ, Holmestad R, The effect of Cu on precipitation in Al-Mg-Si alloys, *Philosophical Magazine*, 87, 3385 – 3413, 2007.

Sandberg N, Slabanja M and Holmestad R, Ab initio simulations of clustering and precipitation in Al–Mg–Si alloys, *Computational Materials Science*, 40, 309-318, 2007.

Vullum PE, van Helvoort ATJ, Mastin J, Andersen ØE, Einarsrud MA, Grande T, Holmestad R, Grain boundary analysis and secondary phases in LaCoO3-based perovskites, *Journal of Materials Science*, 42, 6267-6273, 2007.

Vullum PE, Holmestad R, Lein HL, Mastin J, Einarsrud MA and Grande T, Ferroelastic nano-twinned domains in LaCoO3-based perovskites, *Advanced Materials*, 19, 4399-4403, 2007

Mekonnen W, Arstad B, Klette H, Walmsley JC, Bredesen R, Venvik H, Holmestad R Microstructural characterization of self-supported 1.6μm Pd/Ag membranes, *Journal of Membrane Science*, 310, 337-348, 2008

Nordmark H, Ulyashin A, Walmsley JC, Holt A, Holmestad R, The Temperature Evolution of the Hydrogen Plasma Induced Structural Defects in Crystalline Silicon, *Solid State Phenomena*, 131-133, 315-320, 2008.

Nordmark H, Ulyashin A, Walmsley JC, Holmestad R, A Comparative Analysis of Structural Defect Formation in Si+ Implanted and then Plasma Hydrogenated and in H+ Implanted Crystalline Silicon, *Solid State Phenomena*,131-133, 309-314, 2008.

Rørvik PM, Lyngdal T, Sæterli R, van Helvoort ATJ, Holmestad R, Grande T, Einarsrud MA, Synthesis of ternary oxide nanorods by molten salt flux method, *Inorganic Chemistry*, 47, 3173-3181, 2008

Nagayoshi H, Nordmark H, Holmestad R, Matsumoto N, Nishimura S, Terashima K, Walmsley JC, Ulyashin A, Silicon whisker growth using hot filament reactor with hydrogen as source gas, *Jap. Journ. Appl.Phys*. 47, 4807-4809, 2008.

Vullum PE, Lein HL, Einarsrud M-A, Grande T, Holmestad R, TEM observations of ferroelastic domains in $LaCoO_3$-based ceramics, *Philosophical Magazine*, 88(8), 1187-1208, 2008.

Rørvik PM, Almli Å, van Helvoort A T J, Holmestad R, Tybell T, Grande T and Einarsrud MA, PbTiO3 Nanorod arrays grown by self-assembly of nanocrystals, *Nanotechnology*, 19, 225605, 2008.

Pitt MP, Vullum PE, Sørby MH, Sulic MP, Jensen CM, Walmsley JC, Holmestad R, Hauback BC , Structural properties of the nanoscopic $Al_{85}Ti_{15}$ solid solution observed in the hydrogen-cycled $NaAlH_4$ + 0.1$TiCl_3$ system, *Acta Mat.* In Press, Available online 27 June 2008

Binetti S, Libal J, Acciarri M, Di Sabatino M, Nordmark H, Øvrelid EJ, Walmsley JC, Holmestad R, Study of defects and impurities in multicrystalline silicon grown from metallurgical silicon feedstock, *Mat Sci. and Eng B*, In Press, Available online 13 June 2008

Eberg E, Monsen, AF, Tybell T, van Helvoort ATJ, Holmestad R, Comparison of TEM specimen preparation of perovskite thin films by tripod polishing and conventional ion milling ,Accepted *Journ. of Elec. Micr,* Aug. 2008.