

**Curriculum Vitae Professor Dr. Ir. Antonius T.J. van Helvoort**

<http://www.ntnu.edu/employees/a.helvoort>

- *Work address:* Department of Physics, Høgskolering 5, 7491 Trondheim Norway, Tel. +47-73593637.
- *E-mail:* a.helvoort@ntnu.no
- *Date/place of birth:* 15 June 1973, s'Hertogenbosch, The Netherlands.
- *Civil status:* Cohabitant, two children.

**Summary:**

*Prof. Ton van Helvoort* has an MSc from Technical University Delft, the Netherlands and a PhD from University of Cambridge, UK. Afterwards he worked at the Department of Physics (NTNU, Trondheim Norway) as post doc and was researcher in SINTEF Materials & Chemistry (Trondheim). Since August 2007 he holds an academic position in Condensed Matter Physics at NTNU. The main focus of his work is to develop and transfer competence in advanced transmission electron microscopy (TEM) techniques. He has a special interest in scanning based techniques. In 2013 the Trondheim TEM group installed three new microscopes, including a state-of-the-art double corrected TEM. Since 2007 he is strongly involved in the characterization of the semiconductor nanowires grown by molecular beam epitaxy (MBE). Furthermore, he contributes to the focus ion beam (FIB) developments at NTNU NanoLab. Two PhD candidates were successfully supervised by van Helvoort. At present he is supervising two PhD candidates, three MSc students and co-supervising two PhD students. In the academic year 2014/15 he was on a sabbatical leave at the University of Cambridge and By-Fellow at Churchill College Cambridge.

**Academic Degrees**

- 2002: *Phd degree (Materials Science):* Cambridge University (Corpus Christi College), UK. Thesis title: "Microstructural characterization of electrostatic bonding". Thesis advisor: Dr Kevin M. Knowles and Dr John A. Fernie (TWI Ltd.).
- 1999: *Master of Science degree (Materials science):* Delft University of Technology, Netherlands. Thesis title: "Diffusion bonding of zirconia to stainless steels"

**Employment**

- Aug. 2007- : *Associate professor (since Sep. 2014 professor)* "Transmission electron microscopy" at Department of Physics (section Solid State Physics), Norwegian University of Science and Technology (NTNU).
- 2005-July 2007: *Researcher* SINTEF Materials and Chemistry (Materials Physics), Trondheim.
- Feb. 2003 - 2006: *Postdoc* at Department of Physics (Section Solid State Physics, TEM group), Norwegian University of Science and Technology (NTNU).

**Research areas and other activities**

- Conventional and advanced (for example Cs-corrected) transmission electron microscopy (TEM), with special interest in scanning transmission electron microscopy (STEM) and electron energy loss spectroscopy (EELS).
- Focus ion beam microscopy (FIB)
- Nanotechnology (main topics semiconductor nanowires and 2D crystals such as graphene)
- Daily running TEM Gemini Centre (<http://www.ntnu.edu/web/geminicentre/tem>)
- Training and advising users and members of the TEM Gemini Centre.
- NORTEM project (State-of-the art TEM infrastructure for Norway): Planning and realization Trondheim node. In 2013 three new TEMs were successfully taken in use in Trondheim.
- Organization conference SCANDEM2016

**Supervision of PhD/Master Students (in projects and diploma)/training of PhD students**

- Main supervisor for 5 PhD students (J. Todorovic (Nanowire solar cells, started Sep. 2009, fulfilled Dec. 2012), H. Kauko (Quantitative STEM, started Sep. 2009, fulfilled Dec. 2013), V.T. Fauske (FIB and TEM characterization Nanowire-substrates interfaces, fulfilled June 2016), Julie Stene Nilsen (FIB & TEM of III-V nanowire/graphene heterostructures, started Feb. 2015) and A. B. Mosberg (Nanostructuring by FIB, started Aug. 2015)
- Co-supervisor four PhDs (R. Sæterli (Thermo-electrics/Multiferroics), fulfilled Sep. 2010, Martinsen (Silicon microfiber solar cells, fulfilled Sep. 2015), Ida Marie Høiaas (Graphene-III/V heterostructures, started Sep. 2014) and Theodor Secanell Holstad (Domain boundaries in multiferroics”, starting date Sep. 2016).
- Member six PhD evaluation committees (NTNU, DTU(Dk), UiO, Lund(S), Linkjop.(S), HBV).
- Supervising 32 project/diploma/exchange students at NTNU since 2003.
- Lecturing, workshops and training of PhD students at NTNU in the use of conventional and advanced (energy filtered TEM, EELS, lattice imaging aberration correction, etc.).

**Teaching**

- *Nanotools*, 2007-2008, 2<sup>nd</sup> year Nanotechnology, 2012-2014, 4<sup>th</sup> year Nanotechnology. Set-up and run course since it was introduced (7.5 study points).
- *Functional Materials*, 2009-2013, 4<sup>th</sup> year Physics (7.5 study points).
- *Materials Physics*, 2015 & 2016, 5<sup>th</sup> year Physics.
- *General Physic lab non-physic students*, 2016, lab coordination.
- *Electron diffraction & advanced TEM*, 2008-2016(“intro course MSc & advanced PhD course).
- *FIB module* in PhD course *Nanostructuring*, 2013, 2014 & 2016.
- *Ekspert i Team*, Nanoteknologi, 2017.

**Publications** (Status August 2017. For complete and updated list see: <http://folk.ntnu.no/helvoort/publications.pdf>)

- Total number of international peer reviewed journal papers: 64
- *h*-factor: 18 (in ISI Web of Science & Scopus) & 20 (Google Scholar).
- Total number of conference contributions: ca. 185.
- Total number of entries in Cristin (Current Research Information System In Norway): 295

**Example recent peer-reviewed journal papers:**

Heilmann, M.; Munshi, A. M., Sarau, G., Göbelt, M.; Tessarek, C., Fauske, V. T., **van Helvoort**, A. T.J., Yang, J., Latzel, M., Hoffmann, B., Conibeer, G., Weman, H., Christiansen, S., "Vertically Oriented Growth of GaN Nanorods on Si using Graphene as Atomically Thin Buffer Layer", *Nano Letters*, 16, 3524, 2016

Fauske, V. T., Huh, J., Divitini, G. Dheeraj, D. L., Munshi, A. M., Ducati, C. Weman, H., Fimland, B.-O., **van Helvoort**, A. T. J. , “In situ heat-induced replacement of GaAs Nanowires with Au”, *Nano Letters*, 16, 3051, 2016.

Ren D., Dheeraj D. L., Jin C., Nilsen J. S., Huh J., Reinertsen J. F., Munshi A. M., Gustafsson A., **van Helvoort** A. T. J., Weman H., and Fimland, “New Insights into the Origins of Sb-Induced Effects ...”, *Nano Letters*, 16, 1201, 2016.

Huh J., Kim D.C., Yun H., Munshi A.M., Dheeraj D.L., Kauko H., **van Helvoort**, Lee S.W., Fimland B. O., Weman H., “Rectifying Behavior Individual GaAs<sub>1-x</sub>Sb<sub>x</sub> Nanowires with Compositional Gradients”, *Nano Letters*, 15, 3709, 2015.

Jones L., MacArthur K.E., Fauske V.T., **van Helvoort** A.T.J., and Nellist P.D., “Rapid Estimation of Catalyst Nanoparticle Morphology and Atomic-coordination by Z-contrast Electron Microscopy”, *Nano Letters*, 14, 6336, 2014.

Kauko H, Munshi AM, Grieb T, Muller K, Rosenauer A, Fimland B-O, and **van Helvoort** AT., “Antimonide surface depletion during the growth of GaAsSb and GaAs/GaAsSb nanowires”, *Journal of Applied Physics*, **116**, 144303, 2014.

Munshi A. M., Dheeraj D. L., Fauske V. T., Reinertsen J. F., Ahtapodov L., Lee K. D., Heidari B., **van Helvoort** A. T. J., Fimland B. O., and Weman H, “Position Controlled Self-Catalyzed GaAs Nanowire Arrays on Silicon by Nanoimprint Lithography and Molecular Beam Epitaxy”, *Nano Letters*, 14, 960-966, 2014.

Kauko H., Zheng C. L., Zhu Y., Glanvill S., Dwyer C., Munshi A. M., Fimland B.-O., **van Helvoort** A. T. J. and Etheridge J., “Compositional analysis of GaAs/AlGaAs heterostructures using quantitative scanning transmission electron microscopy”, *Applied Physics Letters*, 103, 232111, 2013.

Ahtapodov L, Todorovic J, Olk P, Mjaaland TS, Slaattnes PRT, Dheeraj DL, **van Helvoort** ATJ, Fimland B-O and Weman H, “A Story Told by a Single Nanowire: Optical Properties of Wurtzite GaAs”, *Nano Letters*, 12, 6090, 2012.

Munshi M. A., Dheeraj D. L., Fauske V. T., Kim D.-C., **van Helvoort** A. T. J., Fimland B.-O.and Weman H., “Vertically Aligned GaAs Nanowires on Graphite and Few-Layer Graphene”, *Nano Letters*, 12, 4570-4576, 2012.