Curriculum Vitae Guus Rijnders

Personal details

Prof. dr. ing. Guus Rijnders

Male/female:	Male
Date of birth:	13-02-1964
Nationality:	Dutch

Master's (‘Doctoraal’)

University/College:	HTS Enschede
Date:	July 1986
Main subject:	Applied Physics

Doctorate

University	University of Twente
Date:	October 31, 2001
Supervisors:	Prof. Horst Rogalla, Prof. Dave H.A. Blank
Title of thesis:	*The InitialGrowth of Complex Oxides: Study and manipulation* (*cum laude*)

Work experience since graduating

1986	Research engineer FFW/Applied Physics/ University of Twente Subject: *"Research on laser welding”*
1987-1988	Military duty
1988-1989	Research engineer FFW/Applied Physics/ University of Twente Subject: *"Research on laser welding”*
1989-1997	Research engineer Low Temperature Division/Applied Physics/ University of Twente.
1997-2001	Thesis work *"Initial growth of complex oxides: study and manipulation*", Promotor: prof.dr. H. Rogalla, co-promotor dr. ing. D.H.A. Blank October 31, 2001.
2001-2003	Assistant professor and responsible for the materials science at Low Temperature Division, Applied Physics, University of Twente.
2003-2006	Assistant professor Inorganic Materials Science of the Faculty Science and Technology of the University of Twente.
2006-2010	Associate professor Inorganic Materials Science of the Faculty Science and Technology of the University of Twente.
Since 2010	Professor NanoElectronic Materials Science, part of Inorganic Materials Science.
Since 2011	Chairman of Inorganic Materials Science
Since 2015	Ad Interim Scientific director MESA+ Institute for Nanotechnology
Since 2015	Chairman of NanolabNL.
Since 2018	Scientific director MESA+ Institute for Nanotechnology

Brief summary of research over the last five years

The research I have conducted after finishing my PhD, is related to the materials science of complex materials, mostly used for electronic devices. The research focuses on the structure-property relation of atomically engineered complex (nano)materials, especially thin film complex oxides. The class of investigated materials includes, amongst others, ferromagnetic, superconducting, ferroelectric as well as piezoelectric materials. I have advanced the field of synthesis and (in- situ) atomic-scale characterization of complex oxides, which resulted in a significant revival in the field of functional materials. Next to the aforementioned scientific directions, I started public-private partnerships in the field of functional and smart materials, such as piezoelectric and ferroelectric materials, and their integration with electronic and micro electromechanical systems (MEMS), for applications in, amongst others, ultrasound and sensing devices (for health applications). Recently I started research directions in the field of neuromorphic computing, on brain- inspired materials systems.

Other academic activities

- Member of the scientific international advisory board of the workshop of oxide electronics.
- Member of the Techn. Progr. Committee of the IEEE Nano/Micro Eng. and Molecular Systems conference
- Organiser of several symposia and workshops, amongst others: the symposium on "Advances in In-Situ Characterization of Film Growth and Interface Processes" for the Fall '06 MRS (Materials Research Society) meeting and Fall '08, and Symposium organizer 2009 MRS-spring meeting San Francisco "Novel Functional Properties at Oxide-Oxide Interfaces".
- I organised two international conferences as chair: In June 2012, the international Electroceramics XIII conference, organized at the University of Twente, Enschede, the Netherlands, and in September 2012, the 19th international Workshop on Oxide Electronics, organized in Apeldoorn, the Netherlands.
- Referee for, amongst others, Nature, Nature Materials, Nature Communications, Physical Review Letters, Physical Review B, Applied Physics Letters, Advanced Materials, Thin Solid Films, Journal of Alloys and Compounds, Journal of Physics D, European Physics Journal B, Europhysics Letters, Chemistry of Materials.
- Reviewer for science foundations, amongst others, NWO; Dutch national science organization (TTW, vernieuwingsimpuls committees, perspectief, etc.), Nordisk Innovations Center (Norway), SNF the Swiss National Science Foundation (Switzerland), the United States-Israel Binational Science Foundation, the Academy of Finland, the Research Council of Norway, U.S. Department of Energy (DOE) 2014 Energy Frontier Research Centers.
- In April 2009, I successfully finished the Leadership development program of the ECIU. This program aims to contribute to leadership development of potential leaders.
- Member of the board of Applied Piezo foundation, with the aim to facilitate the access of industry to utilize piezo technology. (http://applied-piezo.com)
- Member of the executive council of the top sector "High tech systems & materials".
- Member of the supervisory board of the "Topconsortium voor Kennis en Innovatie (TKI HTSM)"
- Member of theme committee NWO Materials (https://www.nwo.nl/en/policies/top+sectors/materials+science/)
- Member of materialmen NL platform (https://materialennl-platform.nl)
- Chairman of the board of NanoLabNL (https://nanolabnl.nl)

Funding and Awards
-Funding for research is obtained from several agencies, amongst others, NWO (FOM, STW, CW), Topsector HTSM (HTSM and HTM funding), EU funding (FP7 and Horizon 2020), funding through private-public partnerships, as well as direct private funding. Personal funds: In 2006, I received a NWO-CW VIDI grant (600 KEuro) on "The amazing electronic effects at oxide interfaces". In 2016, I received a TOP PUNT grant (1.75 MEuro).

-In 2014, I received the "FOM valorisatie prijs" (250 KEuro). This annual prize is awarded to a Dutch researcher within the field of physics who has successfully managed to make the results from his or her own research useful for society. The NWO Physics Valorisation Prize is a conferred honour and an inspiring example for others.

-In 2018, I received the Julius Springer Prize. This annual prize is awarded to a scientist who has made an outstanding and innovative contribution to the field of applied physics.

Publications
I have co-authored over 245 publications with a total of over 7100 citations, h- index 44, (WoS). Publications include articles in Physical Review Letters, Applied Physics Letters and 11 in Nature Group journals.

Outreach
I regularly give public lectures (festivals, societies, schools) and participate in public debates on nanoscience and technology. Since 2011, I organise the "Universitent" at the "Zwarte Cross" and "Manana-Manana" festivals. At these festivals, more than 5000 visitors attend scientific presentations from enthusiastic researchers as well as experiments from Science on Tour students.

Patents and valorisation
- J. Broekmaat, F. Roesthuis, G. Rijnders, D.H.A. Blank, "side approach for ultra fast scanning".
- Co-founder of TSST BV (Twente Solid State Technology), a company specialized in apparatus for thin film growth, like high pressure RHHED UHV-PLD systems. A number of systems are operational in leading laboratories, like Madison (Wisconsin), Augsburg, IBM (Zurich), Birmingham, Berkeley, Trondheim.
- Co-founder of SolMateS BV (Solution in Material Science), a company specialized in thin film applications in nanotechnology.

Education activities
Currently, I contribute to the Molecules & Materials master track of Chemical Engineering, the materials master track of Applied Physics, as well as the graduate programme "Physics and Chemistry of Novel Materials for Nanoscience and Nanotechnology".
I have developed courses on Advanced Materials (structure-properties relations and applications of inorganic advanced materials) as well as Advanced Characterization (advanced x-ray scattering) in the master track Chemical Engineering, Applied Physics and Nanotechnology.

(Co)promotor of:

- Daniel Monteiro Cunha (2021) *Self-assembled Vertically Aligned Nanocomposites for Solid-State Batteries*
- Jaap Geessinck (2020) *Charge transfer at the interface between complex oxide thin films*
- Minh Thanh Do (2020) *Mechanisms of polarization fatigue in ferroelectric PbZr0.52Ti0.48O3 epitaxial thin-film capacitors*
- Ron Hendriks (2019) *Interface-Engineering for All-Oxide Solid-State Batteries*
- Jun Wang (2019) *Oxide Electrodes for Pb(Zr0.52Ti0.48)O3 Capacitors*
- Rik Groenen (2017) *Stoichiometry control in oxide thin films by pulsed laser deposition*
- David Dubbink (2017) *Epitaxial oxides on silicon by Pulsed Laser Deposition*
- Alim Solmaz (2017) *Interface and domain engineering in ferroelectric BiFeO3 thin films*
- Kurt Vergeer (2017) *Structure and Functional Properties of Epitaxial PbZrxTi1-xO3 Films*
- Werner Wessels (2016) *Growth monitoring during pulsed laser deposition of oxides using atomic force microscopy*
- Anirban Ghosh (2016) *Engineering Ferroelectric Switching Dynamics*
- Jeroen Blok (2015) *Experimental design of oxide materials*
- Maarten Nijland (2014) *Anisotropy in Patterned Perovskite Oxides*
- Nirupam Banerjee (2014) *Epitaxial perovskite oxide devices fabricated by lift-off technology*
- Peter Brinks (2014) *Size effects in thermoelectric cobaltate heterostructures*
- Brian Smith (2014) *Ferroelectrics from the bottom up: investigation of nanoscale boundary conditions in ferroelectric thin films using novel bottom-up growth techniques*
- Bouwe Kuiper (2014) *Size effects in epitaxial oxide thin films*
- Xin Wan (2013) *Tailored piezoelectric thin films for energy harvester*
- Steenwelle, R.J.A. (2012) *Strain and composition effects in epitaxial PZT thin films*
- Josée Kleibeuker (2012) *Reconstructions at complex oxide interfaces*
- Peter de Veen (2011) *Interface Engineering for Organic Electronics; Manufacturing of Hybrid Inorganic-Organic Molecular Crystal Devices*
- Hans Boschker (2011) *Perovskite oxide heteroepitaxy, strain and interface engineering*
- Oktay Yildirim (2010) *Self-Assembled Monolayers on Metal Oxides: Applications in Nanotechnology*
- Minh Duc Nguyen (2010) *Ferroelectric and piezoelectric properties of epitaxial PZT films and devices on silicon*
- Gerwin Hassink (2009) *Two-dimensional electron layers in perovskite oxides*
- Paul te Riele (2008) *Direct Patterning of Oxides by Pulsed Laser Stencil Deposition*.
- Joska Broekmaat (2008) *In-situ growth monitoring with scanning force microscopy during pulsed laser deposition*
- Matthijn Dekkers (2007) *Transparent conducting oxides on polymeric substrates by pulsed laser deposition*
- Mercy Mathews (2007) *Structural and magnetic properties of epitaxial La0.67Sr0.33MnO3 films and nanostructures*
- Mark Huijben (2006) *Interface Engineering for Oxide Electronics – Tuning electrical properties by atomically controlled growth*
- Koray Karakaya (2006) *CeO2 and HfO2 high-K dielectrics by pulsed laser deposition: from binary oxides to nanolaminates.*
- Mai Pham (2005) *Ferroelectric composites of PZT-Pt*
- Dragana Mijatovic (2004) *MgB2 thin films and Josephson devices*
- Victor Leca (2003) *Heteroepitaxial growth of copper oxide superconductors by pulsed Laser Deposition*