

# CURRICULUM VITAE PROF. DR. ING. DAVE H.A. BLANK

## WORK EXPERIENCE

### PERSONAL INFORMATION David Hermanus Adrianus BLANK



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Sex Male | Date of birth 09/01/1953 | Nationality Dutch

- 2018 - present [Advisor Executive Board](#)  
Saxion University of Applied Sciences
- 2015 - present [Chief Scientific Ambassador](#)  
University of Twente
- 2015 - present [Distinguished Professor](#)  
University of Twente
- 2012 - present [Membership AWTI](#)  
Advisory Council for Science, Technology and Innovation Policy (AWTI)
- 2010 - present [Chairman Executive Board](#)  
NanoNextNL, national program on nanotechnology
- 2007 - 2015 [Scientific Director MESA+ Institute for Nanotechnology](#)  
University of Twente
- 2003 - present [Full professor Inorganic Materials Science](#)  
Faculty Science and Technology, University of Twente
- 2000 - 2002 [Associate professor Low Temperature Division](#)  
Faculty Applied Physics, University of Twente
- 1998 - 1999 [Visiting Scientist](#)  
Geballe Laboratory of Advanced Materials, Stanford University
- 1992 - 1998 [Assistant professor Low Temperature Division](#)  
Faculty Applied Physics, University of Twente

## EDUCATION AND TRAINING

- 1987 - 1991 [Doctorate](#)  
Thesis: High Tc thin films prepared by laser ablation: an experimental study  
April 12, 1991, University of Twente, Supervisor: prof. dr. Horst Rogalla
- 1972 - 1976 [Master Applied Physics](#)  
University of Applied Sciences, SAXION, Enschede, The Netherlands
- 1969 - 1972 [MTS Enschede: Werktuigbouwkunde](#)
- 1966 - 1969 [LTS Enschede: TTO \(Technisch Theoretisch Onderwijs\)](#)

## JOB-RELATED ACTIVITIES (present)

- Chairman of the executive board of the national nanotechnology initiative NanoNextNL, a consortium of more than one hundred companies, universities, knowledge institutes and university medical centres, which is aimed at research into micro and nanotechnology. The total sum involved for NanoNextNL is 250 million Euros;
- "Figurehead" National Science Agenda Route on Quantum and Nanotech of Dutch Science Organisation;
- Member of high-level group meetings of EU and Ministry of Economic Affairs;
- Captain of science of High-Tech top team, a governing authority to give advice on expenditures of the national budget for knowledge and innovations projects and programmes;
- Member of the Advisory Council for Science, Technology and Innovation Policy (AWTI) that advises the Dutch government and parliament on policy in the areas of scientific research, technological development and innovation;
- Board member Investment Direct Investment Committee OostNL;
- Board member NWO-table Chemistry;
- Chairman Supervisory Board Netherlands Center for Multiscale Catalytic Energy Conversion (MCEC);
- Chairman Cooperation Surgery, MST Enschede;
- Board member Advisory Counsel Advanced Research Center for Nanolithography (ARCNL);
- Member of several evaluation boards, e.g., NIKKEF, ARCNL, Chalmers, NNT.

## JOB-RELATED ACTIVITIES (past)

- Flagship captain of the NanoNed programme on nano-electronic materials science;
- Chair committee for the National Nanotechnology Initiative, resulting in the strategic research agenda;
- Chairman (2009-2015) Scientific Board MC2, institute for micro- and nanotechnology, Chalmers University, Sweden;
- Co-chair of several MRS-Symposia;
- Referent of several scientific journals, like Nature, Nature Material, Nature Nanotechnology, Advanced Materials, Applied Physics Letters;
- Member Supervisory Board top-clinical hospital MST, Enschede, The Netherlands;
- Chair and author of the NWO strategy document 'Towards a multidisciplinary national nanoscience programme' (2006);
- Author of the Strategic Research Agenda of the Netherlands Nano Initiative (NNI) (2008) invited by Dutch government;
- Co-founder and initiator of Advanced Technology, a multidisciplinary technical bachelor programme of the University of Twente.

## OTHER ACTIVITIES

- Founder of Faculty Club of University of Twente;
- Chairman of Science Café Enschede;
- Founder and chairman of Qua Art Qua Science, a foundation that bridges the gap and stimulates contacts between science and Art;
- Chairman of Art in the Park, a foundation that organizes a yearly open-air art manifestation, visited by more than 25.000 people downtown Enschede;
- Chairman of "Social Square Twente", a foundation related with FC Twente that provides a social network for employment projects for (young) people and located at the soccer stadium;
- Member foundation music festival Memphis Heart & Soul, yearly at Pentecost, city centre Enschede.

## PATENTS AND COMMERCIALISATION

- J.J. Broekmaat, F.J.G. Roesthuis, D.H.A. Blank, A.J.H.M. Rijnders, "Scanning Probe Microscope", Patent no. PCT/EP2007/009168, (2007);
- Sah, H.L. Castricum, J. Vente, D.H.A. Blank, and J.E. ten Elshof, "Microporous molecular separation membrane with high hydrothermal stability", European Patent application EP 06100388.5 (2006);
- J. Broekmaat, F. Roesthuis, G. Rijnders, D.H.A. Blank, "side approach for ultra fast scanning", PCT/EP2007/09168 (2006);
- T. van Gestel, H. Kruidhof, H.J.M. Bouwmeester, D.H.A. Blank, "Ceramic membrane, its preparation and use", European Patent 05077536.0 (2005);
- Co-founder of TSST BV (Twente Solid State Technology), a company specialized in research equipment for thin film growth, like high-pressure RHEED 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. SolMateS is developing industrial systems, in particular for MEM and NEM devices;
- Founder of ID4All.nl BV (Ideas for All), a holding that gives advice and stimulates initiatives on materials science and its applications;

## HONOURS AND AWARDS

- Royal decoration (2010) Knighthood of the Order of the Dutch Lion;
- Distinguished professor University of Twente;
- FOM Valorisation Award 2014 for innovations of fundamental science (250 K);
- "Ten Hag" performance award 2012 for his activities for East Netherlands;
- "Simon Stevin Meester" STW award 2011 for his achievements in applied sciences (500 K);
- NWO-TOP-CW grant (2009) (1.1 M);
- VICI laureate (2003) of NWO (Dutch Science Foundation) (1.3 M);
- "Zilveren Haring" award 2007 for his initiatives to promote the region of Twente;
- Grant visiting scientist at Stanford University (1998) of STW and Stanford University.

- Honorary member Harambee, volleyball club University Twente;
- Honorary member Arago, Student Union Applied Physics University Twente;
- Honorary member Student Union University Twente.

## MEMBERSHIPS

- Member of the Swedish Royal Academic of Science Gothenburg, nominated by Chalmers University
- Member of AcTI, Dutch Academy of Technology and Innovation
- Member of American and European Materials Research Society
- Board of delegates of European Materials Research Society
- Member Scientific Board Swedish Foundation of Strategic Research (SSF) OXIDE, Chalmers University
- Member Advisory Board MaNEP, Swiss initiative on materials science in nanotechnology
- Member Board of Commissioners of Medical Spectrum Twente (top-clinical hospital in Enschede)
- Member of editorial board of Applied Physics A

## PUBLICATIONS (TOP 10) with citations 01-12-2018

- G. Koster, L. Klein, W. Siemons, G. Rijnders, J. S. Dodge, C-B. Eom, D.H.A. Blank, and M.R. Beasley, "Structure, physical properties, and applications of SrRuO<sub>3</sub> thin films", *Reviews of Modern Physics* (2012) 84, 253-298 (citations 232 )
- M. Huijben, A. Brinkman, G. Koster, G. Rijnders, H. Hilgenkamp, and D.H.A. Blank, "Structure-Property Relation of SrTiO<sub>3</sub>-LaAlO<sub>3</sub> Interfaces", *Advanced Materials* (2009) 12, 1665-1677 (citations 212)
- G. Koster, B.L. Kropman, G. Rijnders, D.H.A. Blank, H. Rogalla, "Quasi-ideal strontium crystal surfaces through formation of strontium hydroxide", *Applied Physics Letters* (1998) 73, 2920-2922 (citations 511)
- G. Rijnders, G. Koster, D.H.A. Blank, H. Rogalla, "In situ monitoring during pulsed laser deposition of complex oxides using reflection high energy electron diffraction under high oxygen pressure", *Applied Physics Letters* (70) 1888-1890 (citations 167)
- Brinkman, M. Huijben, M. van Zalk, J. Huijben, U. Zeitler, J.C. Maan, W.G. van der Wiel, G. Rijnders, D.H.A. Blank, and H. Hilgenkamp, "Magnetic effects at the interface between nonmagnetic oxides", *Nature Materials* (2007) 6, 493-496 (citations 1010)
- W. Siemons, G. Koster, H. Yamamoto, W. A. Harrison, G. Lucovsky, Th.H. Geballe, D.H.A. Blank, and M.R. Beasley, "Origin of Charge Density at LaAlO<sub>3</sub> on SrTiO<sub>3</sub> Heterointerfaces: Possibility of Intrinsic Doping", *Physical Review Letters* (2007) 98, 196802 (citations 419)
- M. Huijben, G. Rijnders, D.H.A. Blank, S. Bals, S. Van Aert, J. Verbeeck, G. Van Tendeloo, A. Brinkman, H. Hilgenkamp, "Electronically coupled complementary interfaces between perovskite band insulators", *Nature Materials* (2006) 5, 556-560 (citations 269)
- G. Rijnders and D.H.A. Blank, "Build your own superlattice", *Nature* (2005) 433, 369-370 (citations 90)
- H. Hilgenkamp, Ariando, H.J.H. Smilde, D.H.A. Blank, G. Rijnders, H. Rogalla, J.R. Kirtley, C.C. Tsuei, "Ordering and manipulation of the magnetic moments in large-scale superconducting pi-loop arrays", *Nature* (2003) 422, 50-53 (citations 189)
- G. Catalan, A. Lubk, A.H.G. Vlooswijk, E. Snoeck, C. Magen, A. Janssens, G. Rispens, G. Rijnders, D.H.A. Blank, and B. Noheda, "Flexoelectric rotation of polarization in ferroelectric thin films", *Nature Materials* (2011) 10, 963-967 (citations 248)

Total publications: 301, sum of times cited: 10,530, h-index: 50

## BIOGRAPHY

Dave H.A. Blank was born in 1953 in Amsterdam, Netherlands. He started his studies on the primary technical school (LTS), followed by the secondary technical school (MTS) and higher technical school (HTS). After his masters in Applied Physics, he received in 1991 his PhD in Physics from the University of Twente, Netherlands for his dissertation on *High-Tc thin films prepared by laser ablation: an experimental study*, under supervision of prof. dr. Horst Rogalla.

In 1992 he became assistant professor in Rogalla's group. After a research fellowship at Stanford in the group of prof. Malcolm Beasley and prof. Theodore Geballe in 1998, he was appointed as associate professor and programme director on the *materials science of interfaces* in the MESA+ Institute for Nanotechnology at the University of Twente. Since October 2002 he is full professor in *Inorganic Materials Science* at the same university. In January 1, 2007 he was the Scientific Director of MESA+ Institute for Nanotechnology, University of Twente. MESA+ host over 550 scientists with an annual budget over 50 MEuro. From September 2016 on, he is Chief Scientific Ambassador and Distinguished Professor at the University of Twente. In 2018 he became the advisor of the board of Saxion, University of Applied Sciences on research-related subjects.

The Inorganic Materials Science research group focuses on growth studies, deposition and structuring techniques, and properties of complex materials, especially oxides. The group developed strategies to build, in an atomic layer-by-layer fashion, inorganic materials by true atomic-deposition control and which thereby exhibit novel and unprecedented properties. His research is based in large part on inventing designer-inorganic (tailor-made) nanomaterials that are prepared by atomic precision. He has (co)authored over 300 papers in refereed journals, holds an h-index of 50, and supervised 34 PhD candidates.

Together with prof. Guus Rijnders the first time-resolved *high pressure RHEED-system* was developed, operating *in-situ* during pulsed laser deposition at high pressures up to 100 Pa. With this system several new growth phenomena have been observed, leading to new growth techniques of complex materials, like pulsed laser interval deposition. Furthermore, the systems can be used to study and realize block-by-block deposition of (artificial) complex materials. The latter has helped to create an entire new branch of science in inorganic materials which rests on the exact and precise control of atomic arrangements through building structures in a bottom-up fashion and having direct one-to-one, atomic-scale control of the constituting layers.

Many of his latest discoveries and contributions have enabled the synthesis of materials, allowing for practical applications in the fabrication of artificial high-temperature superconductors and ferroelectric superlattices. At this present time, many of the structures are being used in the fabrication of two-dimensional electron gases in the field of interface engineering of complex oxide heterostructures. Nowadays, the field of study is considered as a key research area for future oxide device developments. These scientific achievements were honoured as one of the most remarkable scientific breakthroughs of 2007 (*Science* 318 (2007) 1844) of the interface engineering in complex oxide heterostructures, which showed the ability to make novel combinations of oxides that can outperform semiconductor structures. Contributions in this field are reported in, e.g., *Nature Mat.* 5 (2006) 556, *Nature Mat.* 6 (2007) 493, *Nature Mat.* 7 (2008) 270, *Adv. Mat.* 21 (2009) 1665.

Besides his scientific work, he is very active in stimulating scholars to choose for science and technology. He has been chairman for 8 years of the university committee 'centrale commissie studievoorzichting', co-initiator of Advanced Technology, a multidisciplinary science & technology bachelor, started in 2004. He was involved with the establishment of the Student Union, University of Twente and for 5 years member of the supervisory board. He was involved with 'Da Vinci' a science programme on regional television. He had several performances on national television. He is speaker on different occasions to introduce the beauty of science, in particular nanotechnology. He was editor-in-chief of [www.natuurkunde.nl](http://www.natuurkunde.nl) and [www.sciencespace.nl](http://www.sciencespace.nl), both websites that help students during their high school in solving physical problems. He has a number of activities that bridge science and art.

He has given over 100 invited and plenary presentations, including presentations for broader audience, like Lowlands and Zwarte Cross open-air pop festivals.