

## Research Profile Prof. Dr. Thomas Jüstel

### CV

Thomas Jüstel was born in Witten, Germany in 1968. He studied chemistry and biology at the Ruhr-University of Bochum from 1987 to 1992. He received his Ph.D. in coordination chemistry in spring 1995 in the group of Prof. Dr. Karl Wieghardt. Afterwards, he worked as a postdoctoral fellow at the MPI Mülheim for Radiation Chemistry.

He was hired by the Philips Research Laboratories Aachen in summer 1995 as a Research Scientist, where he started to work on luminescent materials. Some years later he became a Senior Scientist and then he was promoted to a Principal Scientist in 2003. In spring 2004 he became a professor for Inorganic Chemistry and Material Sciences at the Munster University of Applied Sciences. His research group "Tailored Optical Materials" deals with photochemistry, nanoscale and  $\mu$ -scale luminescent materials for LEDs, UV radiation sources and x-ray detectors. He also consults several companies and is a lecturer at the German Society of Chemists "GDCh". Since 2013 he is the dean of the department "Chemical Engineering".

His work has been published in about 250 peer-reviewed papers, several book chapters, and lead to more than 200 patent families on luminescent compositions and their application in fluorescent lamps, plasma displays, x-ray detectors, and LEDs.

### Scientific Performance (Status October 2022)

Researcher ID: T-1283-2017  
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Peer reviewed papers (last 5 years)	80
Peer reviewed papers (all)	250
Patent families (Espacenet)	250
Granted US Patents (Freepatentsonline)	100
Citations (Publish or Perish)	~ 14300
h-index (Publish or Perish)	51
g-index (Publish or Perish)	110
Reads (ResearchGate)	~ 102000
Views (Science Direct, Mendeley)	~ 100000
Conference contributions/poster	~ 500
Acquired research funds	~ 15 Mio. €
Research scientists	8
Finished promotions	30
Running promotions	6
BMBF Projects	6
EU-Projects	3
Project Partner Industry	Chemical and Lighting Industry
Partner Universities National	Uni Osnabrück, Uni Tübingen, WWU Münster
Partner Universities International	Estonia: Tartu University Lithuania: Vilnius University Netherlands: Universiteit Utrecht, Universiteit Twente Poland: AGH Cracow, Politechnika Cracow Russia: Moscow University United Kingdom: Brunel University London United States: Harvard Medical School Boston, UC Santa Barbara

## Publications

### a) Published peer-reviewed articles (selection, last five years)

1. B. Malysa, A. Meijerink, W. Wu, T. Jüstel, On the Influence of Calcium Substitution to the Optical Properties of Cr<sup>3+</sup> doped SrSc<sub>2</sub>O<sub>4</sub>, *J. Luminescence* **190** (2017) 234
2. T. Jansen, F. Baur, T. Jüstel, Red Emitting K<sub>2</sub>NbF<sub>7</sub>:Mn<sup>4+</sup> and K<sub>2</sub>TaF<sub>7</sub>:Mn<sup>4+</sup> for Warm-White LED Applications, *J. Luminescence* **192** (2017) 644
3. T. Jansen, J. Gorobez, M. Kirm, M.G. Brik, S. Vielhauer, M. Oja, N.M. Khaidukov, V.N. Makhov, and T. Jüstel, Narrow Band Deep Red Photoluminescence of Y<sub>2</sub>Mg<sub>3</sub>Ge<sub>3</sub>O<sub>12</sub>:Mn<sup>4+</sup>,Li<sup>+</sup> Inverse Garnet for High Power Phosphor Converted LEDs, *ECS JSSST Focus Issue* **7** (2018) R3086 (weekly digest)
4. S. Espinoza, M.F. Volhard, H. Kätker, H. Jenneboer, A. Uckelmann, M. Haase, M. Müller, M. Purschke, T. Jüstel, Deep Ultraviolet Emitting Scintillators for Biomedical Applications - The Hard Way of Downsizing LuPO<sub>4</sub>:Pr<sup>3+</sup>, *Particles and Particles Synthesis* (2018) 1800282
5. D. Böhnisch, J. Rosenboom, T. Jüstel, and F. Baur, On the Blue Emitting Phosphor Na<sub>3</sub>RbMg<sub>7</sub>(PO<sub>4</sub>)<sub>6</sub>:Eu<sup>2+</sup> Showing Ultra High Thermal Stability, *J. Mater. Chem C* **7** (2019) 6012
6. F. Baur, T. Jüstel, Eu<sup>3+</sup> Activated Molybdate – Structure Property Relations, *Opt. Mater. X* **1** (2019) 100015
7. S. Espinoza, M. Müller, H. Jennebor, L. Peulen, T. Bradley, M. Purschke, M. Haase, T. Jüstel, Synthesis of improved UVC emitting LuPO<sub>4</sub>:Pr,Nd nanoparticles/nanoscintillators for the combined treatment with radiation therapy, *Particles and Particles Characterisation* (2019) 1900280
8. M. Laube, T. Jüstel, On the Temperature and Time Dependent Photoluminescence of Lu<sub>3</sub>Al<sub>5</sub>O<sub>12</sub>:Gd, *J. Luminescence* **216** (2019) 116729
9. M. Müller, S. Espinoza, T. Jüstel, K.D. Held, R. Anderson, M. Purschke, UVC emitting LuPO<sub>4</sub>:Pr<sup>3+</sup> nanoparticles decrease radiation resistance of hypoxic cancer cells, *Radiation Research* **193** (2019) 1
10. M. Müller, S. Espinoza, T. Jüstel, K.D. Held, R. Anderson, M. Purschke, UVC emitting LuPO<sub>4</sub>:Pr<sup>3+</sup> Nanoparticles Decrease Radiation Resistance of Hypoxic Cancer Cells, *Radiation Research* **193** (2020) 82
11. S. Fischer, T. Jüstel, Effective Sensitization of Eu<sup>3+</sup> with Ce<sup>3+</sup> by Suppression of Metal-to-Metal Charge Transfer in Composite Structured TbF<sub>3</sub> Fluoride Particles, *J. Luminescence* **223** (2020) 117232
12. M. Volhard, J.J. Christ, L.M. Blank, T. Jüstel, Photocatalytic Plastic Degradation Induced by Seawater, *Sustainable Chemistry and Pharmacy* **16C** (2020), 100251
13. F. Baur, D. Böhnisch, T. Jüstel, Luminescence of Mn<sup>4+</sup> in a Hexafluorogermanate with the Complex Organic Cation Guanidinium [C(NH<sub>2</sub>)<sub>3</sub>]<sub>2</sub>GeF<sub>6</sub>:Mn<sup>4+</sup>, *ECS J. SSST* **9** (2020) 046003
14. M. Laube, B. Herden, E. Seelbach, N. Braun, T. Berger, T. Jüstel, Novel UV-A and -B Emitting Device for Medical Treatment, Photochemistry, and Tanning Purposes, *ECS J. of Solid State Science and Technology* **9** (2020) 065012
15. P. Pues, M. Laube, S. Fischer, F. Schröder, S. Schwung, D. Rytz, T. Fiehler, U. Wittrock, and T. Jüstel, Luminescence and Up-Conversion of Single Crystalline Lu<sub>3</sub>Al<sub>5</sub>O<sub>12</sub>:Pr<sup>3+</sup>, *J. Luminescence* **234** (2021) 117987
16. A. Bents, T. Jüstel, F. Baur, A Novel Synthesis Pathway Towards Rare Earth Fluorides by Using Liquid and Solid State Hexafluorophosphate Salts, *J. Electrochemical Society* **168** (2021) 036502
17. P. Loiko, D. Rytz, S. Schwung, P. Pues, T. Jüstel, J.-L. Doualan, P. Camy, Watt-level Europium laser at 703 nm, *Opt. Letters* **46** (2021) 2702 J.-N. Keil, F. Rosner, T. Jüstel, On the Tb<sup>3+</sup> - Eu<sup>3+</sup> Energy Transfer in KTb<sub>1-x</sub>(WO<sub>4</sub>)<sub>2</sub>:Eu<sup>3+</sup><sub>x</sub>, *J. Luminescence* **244** (2022) 118754

18. F. Schröder, T. Jüstel, Effect of Ga<sup>3+</sup> Doping on the Luminescence and Up-Conversion of Pr<sup>3+</sup> Activated (Lu,Y)<sub>3</sub>Al<sub>5</sub>O<sub>12</sub>, *Optical Materials X* **13** (2022)
19. M. Laube, T. Jüstel, On the Time and Temperature Dependent Photoluminescence of Nd<sup>3+</sup> and Gd<sup>3+</sup> Doped Lu<sub>3</sub>Al<sub>5</sub>O<sub>12</sub>, *J. Luminescence* **245** (2022) 118830
20. T. Tran, J. Kappelhoff, T. Jüstel, R. Anderson, M. Purschke, UV emitting nanoparticles enhance the effect of ionizing radiation in 3D lung cancer spheroids, *Int. Journal of Radiation Biology*, (2022) 2027541

b) Issued US patents (selection)

1. T. Jüstel, P. Huppertz, D. Uhlich, D.U. Wiechert, Light Emitting Device with a Eu-Comprising Phosphor Material, US7446343 B2
2. T. Jüstel, W. Mayr, H. Wiczorek, Device for Generating Images and/or Projections, US7535009 B2
3. T. Jüstel, W. Mayr, J. Meyer, Device for Generating UV-C Radiation, US7808170 B2
4. T. Jüstel, C.R. Ronda, Bräunungsvorrichtung mit Halbleiter-Leuchtdioden, US7901442 B2
5. T. Jüstel, T. Vosgroene, H. Winkler, S. Möller, Luminophores Made of Doped Garnets for pcLEDs, US8088304 B2
6. T. Jüstel, H. Winkler, Illumination Unit Consisting of Discharge Lamp, LEDs and Conversion Phosphors, US8256920 B2
7. T. Jüstel, H. Bechtel, H. Nikol, C.R. Ronda, Illumination System Comprising a Radiation Source and a Luminescent Material, US8417215 B2
8. T. Jüstel, J. Merikhi, H. Ohland, J. Opitz, H.J.G. Radermacher, D.U. Wiechert, GLS-alike LED Light Source, US8651723 B2
9. H. Winkler, R. Petry, T. Vosgroene, T. Jüstel, A. Katelnikovas, D. Uhlich, Co-doped 1-1-2 nitrides, US 8858834 B1
10. T. Jüstel, C.R. Ronda, Tungstate-based scintillating materials for detecting radiation, US 8907292 B1
11. H. Winkler, T. Jüstel, A. Katelnikovas, O. Darcanova, Silicophosphate phosphors, US 8987687 B1
12. H. Winkler, T. Jüstel, A. Bleise, Mn-activated phosphors, US 9080104 B1
13. H. Winkler, T. Jüstel, S. Sakirzanovas, Sm-activated aluminate and borate phosphors, US 9102873 B1
14. G. Greuel, T. Jüstel, J. M. Kuc, Luminescent material particles comprising a coating and lighting unit comprising such luminescent material, US 9334442 B1
15. H. Winkler, T. Jüstel, J. Plewa, Composite ceramic which comprises a conversion phosphor and a material having a negative coefficient of thermal expansion, US 9567519 B1
16. S. Hartmann, M. Büchel, T. Jüstel, Shorts prevention in organic light-emitting diodes, US 9601716 B1
17. H. Winkler, T. Jüstel, A. Katelnikovas, F. Baur, Silicate phosphors, US 9657222 B1
18. T. Jüstel, T. Dierkes, A. Katelnikovas, H. Winkler, (Ca,Sr,Ba)(Y,Lu)Si(4-x)Al(x)N(z-x)O(x) Phosphors as Converter in Fluorescent Devices and Emissive Displays, US9745511 B2
19. A. Zych, R. Petry, H. Winkler, C. Hampel, A. Benker, T. Jüstel, Eu-activated phosphors, US 9758722 B1
20. T. Jüstel, A. Benker, C. Hampel, R. Petry, T. Vosgroene, H. Winkler, Eu-Activated Phosphors, US9856417 B2

**Awards**

1. Innovationspreis Philips Research 1998 „Sonnenbanklampen mit neuen Leuchtstoffmischungen“

2. Innovationspreis Philips Research 2000 „Neuer grüner Leuchtstoff für Plasma Display Panels“
3. Innovationspreis Philips Research 2001 „SrS:Eu – ein roter Leuchtstoff für LEDs“
4. Innovationspreis Philips Research 2002 „Sonnenbanklampen mit verlängerter Lebensdauer“
5. Breakthrough Award Philips Special Lighting 2003 “Dielectric Barrier Discharge Lamps”
6. Patent Award Philips Research 2006 “Silbermedaille für mehr als 25 erteilte US Patente”
7. Journal of Luminescence Award “Top Cited Article 2005 – 2010”
8. Hermes Award Nomination “Tailor-Safe Produkt- und Plagiatschutzsystem”, Hannover-Messe 2011
9. Innovationspreis Münsterland 2011, Kategorie Wirtschaft, 2. Platz, “Tailor-Safe Produkt- und Plagiatschutzsystem”
10. The Best Poster Award „High Temperature Thermal Quenching Measurements on the Big Five of Phosphor Safari“, Phosphor Safari, Hsinchu, Taiwan, 2012
11. Best Poster Award (Second Price), 10<sup>th</sup> International Symposium on Ceramic Materials and Components for Energy and Environmental Applications (CMCee), Dresden, Germany, 2012
12. Best Poster Award (Third Price), International Conference on Materials and Nanotechnologies (FMNT), Tartu, Estonia, 2017
13. Best Poster Award (First Price), Phosphor Global Summit (PGS), San Diego, CA, USA, 2018
14. Lissabon Prize for know-how transfer between academia and industry, FH Münster, Steinfurt, 2018
15. Best Poster Award (Second Price), Phosphor Global Summit (PGS), San Diego, CA, USA, 2019