Inorganic Chemistry & Material Science @ Münster University

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Studied chemistry & biology at
Ruhr-University Bochum,
Ph.D.1995
9 Years at Philips Research
• R&D on Luminescent materials
• R&D on (O)LEDs & PDPs
Since 2004 at Münster University
of Applied Sciences
• Laboratory for Inorg. Chemistry
  and Material Sciences
• Institute for Optical
  Technologies (IOT)
• ~ 100 Granted US Patents
• ~ 270 Publications
• h-index = 52, g-index = 113

Research Areas
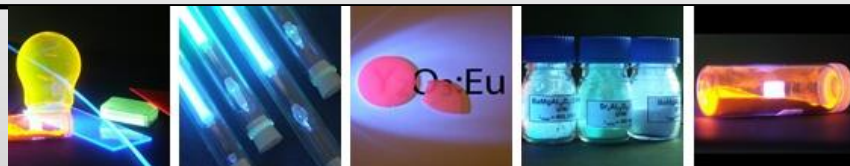
LED + FL Phosphors

Development of novel matrices and particle coatings, spectroscopic characterisation (garnets, (oxy)ortho-silicates, (oxy)nitrides, fluorides)

Afterglow pigments

Revealing the electronic structure of Eu^{2+}/RE^{3+} codoped aluminates
Governing the defect density and depth

Particle coatings of nano- or microscale luminescent pigments

Enhancement of efficiency and stability of materials by coatings due to refractive index matching and diffusion barriers

NIR Phosphors

Biocompatible luminescent materials within the optical window of biomatter, i.e. in the NIR range (diagnostics, photodynamic therapy)

VUV Phosphors

Development of optimised phosphors for noble gas excimer discharges to enable high performance UV radiation sources

Scintillators

Reduction of afterglow of materials for Computed Tomography (CT)
Ultrafast scintillator crystals for Positron Emission Tomography (PET)

Laser materials

RE^{3+} doped fluorides and oxides as gain media in solid-state laser
Faraday rotators

Phosphors for Light Sources, Detectors, and Displays

Eu^{2+} Phosphor	Emission at
SrSiN$_2$:Eu	700 nm
CaS:Eu	655 nm
CaAlSiN$_3$:Eu	650 nm
(Ca,Sr)AlSiN$_3$:Eu	635 nm
Sr$_2$Si$_5$N$_8$:Eu	615 nm
SrS:Eu	610 nm
Ba$_2$Si$_5$N$_8$:Eu	580 nm
Sr$_2$SiO$_4$:Eu	575 nm
SrSi$_2$N$_2$O$_2$:Eu	540 nm
SrGa$_2$S$_4$:Eu	535 nm
SrAl$_2$O$_4$:Eu	520 nm
Ba$_2$SiO$_4$:Eu	505 nm
Sr$_4$Al$_{14}$O$_{25}$:Eu	490 nm
SrSiAl$_2$O$_3$N:Eu	480 nm
BaMgAl$_{10}$O$_{17}$:Eu	453 nm
Sr$_2$P$_2$O$_7$:Eu	420 nm
BaSO$_4$:Eu	374 nm
SrB$_4$O$_7$:Eu	368 nm
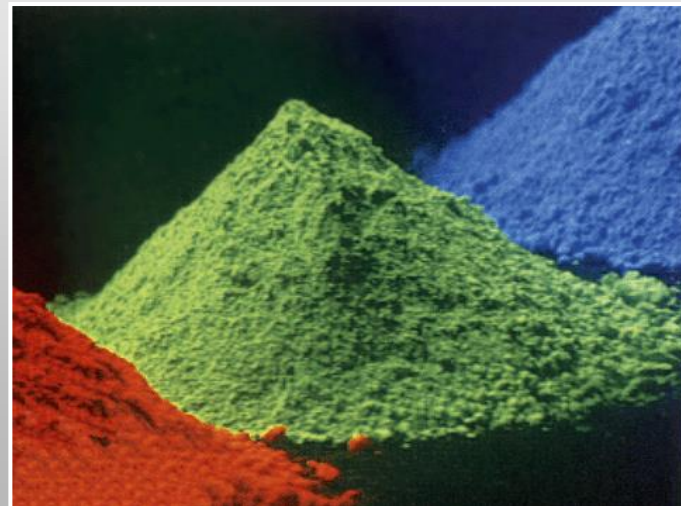
Phosphors are the technological backbone of fluorescent light sources, detectors, and displays since they determine energy efficiency, resolution, lifetime, linearity, CRI, color point consistency, image quality, color gamut and so on