

P04: Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institut – Fraunhofer (Germany)

Description of expertise & activities

The Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institut (HHI) belongs to the Fraunhofer-Gesellschaft, an autonomous non-profit R&D organization, currently maintaining 59 different R&D institutes throughout Germany. HHI has 230 employees and about 60 student research assistants. The core competencies are in the areas of photonic networks and components (nearly 50% of the staff), mobile broadband systems, and electronic imaging technology for multimedia. Along with this expertise, a full range of design, technology, measurement, and experimental capabilities exists for photonic networks, systems and devices. HHI is a valued partner in national and international co-operative R&D projects, where most of the work is carried out in close partnership with industry and universities.

Tasks within BONE

WP13	Optical access network technology using uniform or highly similar low-cost key components, ultra dense wavelength division multiplexed (WDM) systems
WP15	100 Gbit/s per wavelength WDM technology, higher order modulation formats, coherent detection, electronic distortion equalisation
WP16	Application of high-speed transmission based on POF, optical wireless systems (infrared an visible light)
WP23	Inter and intra vehicle communication via FSO

Key personnel

Dr. Ronald Freund (<u>Ronald.Freund@hhi.fraunhofer.de</u>) received the Dipl.-Ing. degree and the Dr.-Ing. degree "On Computer Aided Modelling of Photonic Systems and Networks" in electrical engineering from Technical University of Ilmenau (TUI), in 1993 and in 2002, respectively. From 1993 to 1995 he worked as a research fellow at TUI. In 1997 he co-founded VPI Systems Inc., formally Broadband Network Design GmbH, where he was involved in as Chief Technology Officer and Consultant, responsible for the development of design software for the physical layer of optical networks and national and international research assignment with, e.g., Sprint, AT&T, Luxcore, and the European Union (e.g., ACTS-Demon, etc.). Since 1995 he is with Heinrich-Hertz-Institut in Berlin, where he is currently working as a group leader with the focus on the design of next generation WDM systems. Dr. Freund has authored and co-authored more than 50 scientific publications.

Dr. Colja Schubert (<u>Colja.Schubert@hhi.fraunhofer.de</u>) was born in Berlin, Germany, in 1973. He received the Dipl.-Phys. and Dr. rer. nat. degrees in physics from the Technische Universität Berlin, Germany, in 1998 and 2004, respectively. From 1996-97 he was exchange student at the Strathclyde University in Glasgow, United Kingdom. During his diploma thesis 1997-98, he worked at the Max-Born-Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany. Since 2000 he is a member of the scientific staff at the Heinrich-Hertz-Institute (HHI) Berlin. He has been doing research work in the field of high-speed optical transmission systems. He was in particular involved in all-optical signal processing for high data rates, which was also the topic of his PhD thesis. He authored and co-authored more than 70 scientific papers in the field of optical communications. Dr. Schubert is a member of the German Physical Society.

Klaus-Dieter Langer (Langer (hi.fraunhofer.de) graduated at Braunschweig-Wolfenbuettel University of Applied Sciences and received the diploma degree (Dipl.-Ing.) in Electrical Engineering from the Technical University of Berlin, Germany. In 1981, he joined Heinrich-Hertz-Institut (HHI), Berlin, as a research associate working on broadband communications. He has been involved in numerous research projects where he has worked mainly on the design and performance evaluation of photonic switching systems and networks. In 1992 he changed to the German Federal Ministry of Research and Technology where he served as an adviser on national telecommunications, digital audio broadcasting, and photonics/ optoelectronics R&D. Subsequently at the HHI he addressed the employment of optical and photonic technologies in communication networks, the layout of networks and in particular the topic of cost-efficient optical subscriber lines and the use of WDM for optical access. He is author and co-author of more than 50 scientific publications. Currently he is heading the research on optical access and indoor networks at the Photonic Networks and Systems Department of the Fraunhofer Institute for Telecommunications, HHI.