

MICHAEL KAUTZ

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Birth date: 15.April 1972 in Cottbus



Executive Summary

Designer and development engineer; Management experience (technical 2 years); Design and adjustment of precision optical equipment in aerospace, development of fiber-optic and microtechnical sensors, spectrometers; Graduate engineer in mechanical engineering, Focus on design/microsystem technology; Professional successes: Working on Ready-to-series laser satellite communication terminal, IT skills: Creo 10.0, Inventor 2017, Solidworks 2017, Solid Edge 2020

Target positions

- Target industry: Optical industry / aerospace / medical technology
- Senior designer / development engineer / system developer of complex opto-mechanical or optoelectronic products

Core competencies

Industries

- Photonics, Aerospace Technology, Opto-Electronics, Life Sciences / Healthcare / Medical Technology, Optics

Leadership experience

- Professional 2 years for interns and master's students during the experiment activity and thesis at the Institute of Photonic Technologies

Expertise

- Design of precision optomechanical devices, preparation of fiberglass and microtechnical sensors; Construction, calibration of spectrometers, adjustment of optical devices, micro-, nanopositioning, micro-, nanometrology
- CAD applications: PTC Pro/E or Creo 10.0 (16 years, current), Inventor (9 years: 2000-2008, 2018), SolidWorks 2017 (3 years); Solid Edge 2020 (4 months); Analysis tools: MathCAD (20 years), Origin (8 years), ANSYS Workbench (2 years)
- Software development: LabView programming for measuring stations;
- Measuring techniques: Angle measurement with autocollimation telescopes, interferometric angle position and shape measurements, Pointing, Divergence, intensity based active alignment,
- Process techniques: climate tests on optical modulators, glueing, etching, assembly of fiber optic sensors

Personal skills

- Results orientation; analytical mind; Cooperation in multinational teams; interdisciplinary competences through cooperation with biologists, physicists, medical technicians, finishers, designers

Career

08/16 - to date

Freelance work as a designer

Member of the freelance network

Jencad.de Thuringian Engineers | Jena / Regensburg

- **CAMTEK FRT 03/24-09/25:** Commissioning, quality assurance and service for optical wafer metrology machines
 - ISEL Robot programming for wafer handling
 - 2nd Level Service Support
 - SAP Data processing
- **Qlibri 05/24-06/24:** Design advice on gear and bearing optimization for fiber positioning in the cryo sector
- **MPIA Heidelberg 02/24:** Construction (Creo) various variants for an Echelle Grating adjustment device
- **FORMFACTOR FRT 02/23-11/23:** Development, quality assurance and service for optical wafer metrology machines
 - Robot programming for wafer handling
 - Vibration measurements on XY tables (derivation of test plans for development)
 - Specification of external notch sensor for prealigners
 - Adjustment tools for opt. layer thickness sensor
 - SEMI risk analyses, comparable to construction FMEA
- **OSRAM 01/22-11/23:** Construction (Solidworks) 3D modeling, drawing creation and construction of a measuring station for the characterization and assembly of optical components on laser diode modules: active alignment according to intensity, divergence and pointing, measurement of polarization, spectrum, temperature control, pulsed control of the diodes, gripper construction, camera evaluation with Lab-View 2020
- **OSRAM 01/22-11/23:** Specification and supplier screening for machines and contract manufacturing of miniaturized laser modules using Active Alignment
- **MPIA Heidelberg 06/21-03/22:** Construction (Creo), optimization, prototype construction of astronomical optics (derotator, siderostat for a telescope in Chile)
- **SCANLAB 09/20-12/20:** Optimization of a mirror-rotor connection for an oscillating mirror system - consideration of variants, detailed construction (solid edge), modal and harmonics Analysis with ANSYS Workbench

- **MPE Garching 07/20-12/20:** Construction (Creo) of vacuum/cryo set-ups for a laser-optical ion trap, adjustment system for a spectrometer structure made of profiles
- **OHB 07/19-05/20:** Design of adjustment, mounting and testing devices for a satellite-based spectrometer
- **MPIA Heidelberg 06/19:** CAD model adaptation (Creo) of a lightweight 500 mm astronomical mirror with mirror mount and cardan joint with carbide plain bearings
- **OSRAM 03/18-06/19:** Conception of active adjustment systems for mobile miniature projectors, gripper design, construction laboratory assembly site
 - Construction (Solidworks) adjustment equipment: Hexapod measuring station, construction FMEA, derivation of test plans for development
 - Construction of micro needle gripper with piezo actuators
 - Hardware integration: hexapod, photodetector, cameras, computers
 - Software integration: Programming scan routines in LabView 18
 - Micro-, nano-positioning, micro-assembly of optical components
 - Micro-, nanometrology on miniaturized laser modules
 - Micro-contacting
- **AIP Potsdam 06/17-12/17:** Construction (Inventor) of a motorized cable routing for a 4 m large telescope in Chile, 3D modeling, drawing creation, weight optimization, collision testing
- **Systemtechnik Sömmerda 02/16-05/17:** Housing construction (Creo) for a ticket terminal. Prototype and series optimization, 3D modeling according to designer specifications, drawing creation, construction FMEA, tolerance analysisHousing design for a ticket terminal (Systemtechnik Sömmerda)
 - Sheet metal and injection moulded parts, integration TFT display, printing unit, 1D and 2D scanner, connectors, PCBs, cooling, spring contacts

11/08 – 07/16

Freelance work as a designer

Engineering offices Steinbach-Könitzer-Lopez-Kautz | Jena

- Design for high-precision optomechanical assemblies and devices in the field of astronomy / aerospace in European projects
- **B Steinbach/OHB 09/15-12/15:** Construction (Creo) large adjustment mirror
- **Jenaoptronik 09/12-09/15:** : Construction (Creo) of telescopes, spectrometers, beam splitters for satellite-based temperature measurements including adjustment means, 3D modeling, drawing creation, construction FMEA, derivation of test plans for development, tolerance analysis, entering data into PLM -System Windchill 10.2
- **Jenoptik ESW 02/12-08/12:** Freeform surface modeling (Creo) for a complex aluminum housing of a laser range finder, including the inner optics carrier and shutter, 3D modeling according to designer specifications, drawing creation
- **Synopta 06/11-01/12:** Construction (Pro/Engineer) of a container solution for a mobile laser satellite communication terminal, 3D modeling, drawing creation
- **DESY Hamburg 02/11-06/11:** Construction (Pro/Engineer) and prototype construction of a strain-compensated lens mount for an immersion-jointed three-lens system
- **Synopta 2009/10:** Construction (Pro/Engineer) and commissioning of adjustment and calibration devices for length and angle measurements with autocollimation telescopes. 3D modeling, drawing creation, construction FMEA, derivation of test plans for development
- **Fa. Trefflich 09/10-12/10:** Telescope mount for 40kg telescope, 3D modeling, drawing creation
- **Schmuhl 10/09-12/09:** Freeform surface modeling (Solidworks/Pro/Engineer) MRI patient beds in CFRP
- **Synopta 11/08-12/11:** Construction (Pro/Engineer) and prototype construction of lightweight oscillating mirror systems for laser satellite communication, comparison of variants, creative concept development, morphological box. 3D modeling, drawing creation, construction FMEA, derivation of test plans for development, tolerance analysis

(Change motivation: dissolution of the office by Prof. Steinbach)

04/00 – 10/08

Laboratory engineer

Institute of Photonic Technologies Jena e.V. | Jena

- Design (Inventor), assembly and calibration of spectrometers for fiber optic Bragg grating sensors (FBG) for temperature and strain measurement in European projects
- Development and integration of FBG sensors for pantographs in railway technology (**Siemens**) as well as strain sensors for wind turbines (**Enercon**)
- Construction of temperature-stabilized FBG wavelength references (**Siemens**)
- Design and construction of a fiber-coupled free-beam optics for torque sensors (**Siemens**)
- Head of innovation project: Etched plasmonic micro and nano fiber sensors for DNA detection
- Professional support for interns / Bachelor / Master students

(change motivation: project situation, new focus of the institute on bio-sensors)

9/98 – 03/00

Research assistant

Institute of Joining Technology and Material Testing Jena | Jena

- Design and technology development for fiber optic sensors, miniaturized disc lasers, wire-based Electron beam deflection systems
- Assembly and climate test on fiber-coupled modulators

(change motivation: dissolution of a working group of the microtechnology)

09/97 – 07/98

Diploma Thesis

Piezosystem Jena | Jena

- Hardware and software solution (LabView with integration of micro-controllers) for a semi-automatic Fiber waveguide coupling setup
- Interferometric stability measurements on fine adjustment elements

Vocational training

09/92 – 07/98

Study of mechanical engineering

Brandenburg Technical University Cottbus | Cottbus

- Focus: Design and microsystem technology
- Graduation: Dipl.- Ing. Mechanical Engineering

09/89 – 06/91

Vocational training with Abitur

Brieske Vocational School | Brieske

- Completion: Maintenance mechanic with Abitur

Knowledge and skills

Computer skills

MS-Office: very good (> 5 years)

Creo 10.0: very good (> 5 years)

Inventor 2017: advanced knowledge

LabView: advanced knowledge

Language skills

German: Native language

English: negotiable

French: Basics

Russian: Basics

Other knowledge

- MS Project (Basics)
- Data analysis: Origin 8 (8 years)
- PDM: Windchill 10.2 (3 years)
- FEM: ANSYS Workbench 14.0 (2 years, occasional use)
- Programming languages: HP VEE, Turbo Pascal 7.0, Fortran 77, C, LabView 18
- MathCAD Prime 3.0 (20 years)

Professionally, I offer you my experience for:

- Support in development and construction complex optomechanics systems
- Tasks in the design and technology development of optical, fiber optic and microtechnical assemblies
- Design and construction of prototypes as well as measurement and experimental setups
- Software development of LabView control software for measurement systems

I am a flexible and reliable employee. Through my professional and life experience, I have learned to work with others in the team.

Persistent and always highly motivated, I am opening up new tasks in order to successfully solve them in the interests of the agreed company goals and the customer.

Michael Kautz

Regensburg, 10 October 2025

Cooperations with the following companies and institutes:



Contributions to publications

Schröder K., Ecke W., Kautz M., Willett S., Tchertoriski A., Jenzer M., Kaluza G., "Fiberoptical sensor network for defect monitoring on railway catenary", Proc. of SPIE, Vol. 6585 (2007)

Ecke W., Schroeder K., Kautz M., Joseph P., Willet S., Bosselmann T., Jenzer M., "On-line characterization of impacts on electrical train current collectors using integrated optical fibergrating sensor network", Proc. of SPIE, Vol. 5758, pp. 114-123 (2005)

Kerstin Schroeder, Wolfgang Ecke, Joerg Apitz, Elfrun Lembke and Gerhard Lenschow:
A fibre Bragg grating sensor system monitors operational load in a wind turbine rotor blade MEASUREMENT SCIENCE AND TECHNOLOGY, Meas. Sci. Technol. 17 (2006) 1167–1172

K. Schröder, J. Apitz, W. Ecke, E. Lembke, G. Lenschow: Fibre Bragg grating sensor system monitors operational load in a wind turbine rotor blade, 17th International Conference on Optical Fibre Sensors, edited by Marc Voet, Reinhardt Willsch, Wolfgang Ecke, Julian Jones, Brian Culshaw, Proceedings of SPIE Vol. 5855, pp. 270-273 (2005)

Yiping Wang, Hartmut Bartelt, Wolfgang Ecke, Reinhardt Willsch, Jens Kobelke, Michael Kautz, Sven Brueckner, and Manfred Rothhardt : Fiber Bragg Gratings in Small-Core Ge-Doped Photonic Crystal Fibers. JOURNAL OF ELECTRONIC SCIENCE AND TECHNOLOGY OF CHINA, VOL. 6, NO. 4, DECEMBER 2008, S. 429 ff.

Details about the processed projects

Aerospace

Projects	Details to Projects
Adjustable mirror with mount, mirror diameter 1200 mm	Vertical mounting, light-weight mirror mount, forcible storage, weight relief in the push / pull principle with the aim of a maximum deformation of the mirror surface of <5 nm P / V, hoists
Prototype construction of lightweight mirror systems for laser satellite communication	Modeling, drawing production, production control mirror system and electromagnetic drive systems
Telescopes	Modeling lens mount, temperature expansion compensation mechanism
Spectrometer	Modeling lens mount, temperature expansion compensation mechanism, GRISM socket with temperature expansion compensation mechanism
Beam splitter for satellite based temperature measurements	Design concept, modeling, drawing production, production control Dichroic holder, silicon slit with 200 nm flatness, temperature expansion compensation mechanism, diaphragm construction, housing construction

Design and commissioning of calibration and calibration devices for length and angle measurements	S. Measuring and testing techniques
Telescope mountings	Modeling, drawing production for a 40 kg telescope with search telescope and automatic positioning, table for rotatable mirror system of a laser satellite communication platform

Medical technology

Projects	Details to Projects
EEG electrode pressing system Company: Beemedic	Modeling, drawings production, technology development for a pressure system of 22 electrodes including amplifier Building of 4 prototypes of spider like pressing systems made from stainless steel by laser welding Sensor shape / material optimization Software: Pro/Engineer Wildfire 5 (it is now Creo)
Handle for teleoperator surgery system Company: Avatera	Study for various concepts for operating interfaces for a teleoperator to transfer the hand movements of the operator to a minimal invasive operating robot. Software: Pro/Engineer Wildfire 5 (it is now Creo)
Free-form surface modeling for an MRI patient bed in CFRP Company: Schmuhl	Modeling patient bed and mold form Transfer of an existing design in Solidworks to Pro/Engineer Wildfire 2 (it is now Creo)

Fiber optic spectral sensors

Projects	Details to Projects
Design and construction of a fiber-coupled free-wheel system for torque sensors	Design housing, integration of prisms, collimators, glass fibers
Development and integration of sensors for current collectors in railway engineering as well as strain sensors for wind power plants	Development sensor recordings, integration in aluminum, coal, GRP, concrete, sensor application in railway and wind power plants, development of temperature stabilization for reference sensors and spectrometers
Spectrometer	Mechanics design for spectrometers for fiber Bragg grating sensors, multi-channel variants, integration of temperature-stabilized wavelength references, setup, calibration

Micro- and nanotechnology

Projects	Details to Projects
Miniaturized Disc Laser	Soldering device, masking signal for gold coating of laser crystals with $D = 1.2 \text{ mm}$
Wirebased electron beam deflection systems	Design of an etched silicon wafer for the reception of gold wires with $D = 100 \text{ }\mu\text{m}$, development of the production technology
Design and technology development for fiber optic sensors	Laser-cut positioning plates for glass fibers $D = 125 \text{ }\mu\text{m}$ to produce a fiber line with 13 fibers, spacing $130 \text{ }\mu\text{m}$
Plasmonic fiber Bragg Grating Bio-sensors	Development of a technology for etched Fiber Bragg Gratings, coating with gold, spectral evaluation for the detection of DNA binding reactions

Measuring and testing technology

Projects	Details to Projects
Design and commissioning of calibration and calibration devices for length and angle measurements	Integration of angle-measuring systems, autocollimation telescopes, reference mirrors, double-image prism, construction, lapping and adjustment of mirror pentaprisms to 0.1° , lapped linear guides,
Measuring station Adhesive grippers	Control of a measuring station for an adhesive gripper with HP VEE
Measuring station Fiber waveguide coupling	Control of a semi-automatic device for fiber-waveguide chip coupling, development of the control software in LabView, microcontroller control in C
Measuring station Fiber Bragg reference grating	Control of a measuring station for the automated recording of wavelength-temperature curves Temperature-compensated fiber Bragg reference grating, control in DELPHI

Housing construction

Projects	Details to Projects
Laser Range Finder	Freeform surface modeling for a complex housing Al housing with wall thickness 0.8 mm , rubber coating, belt holder, Shutter, complex optical carrier made of Al for the inclusion of a prism, the IR optics and the laser diode Rangefinder module
Ticket service terminal	Housing construction for a ticket terminal (sheet metal, injection-molded parts), integration flat screen, printing unit, scanner, sensors, circuit boards