

CURRICULUM VITAE

Sergey B. Biryuchinskiy

Date of birth: 31 January 1974



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Education:

1990–1996 Institute of Fine Mechanics & Optics, St. Petersburg, Russia

- M.S., Opto-electronic devices and systems
- Qualifications: engineer-optics-physics

1996–1999 Institute of Fine Mechanics & Optics, St. Petersburg, Russia

- Ph. D., Quantum electronics
- Dissertation title: Optical systems with recycle photons.

Publications and inventions:

about 30 papers and 50 inventions.

Area of interests:

R&D, Optics, Laser develop and applications, Telecommunications (RF and optics devices, antenna design), Professional cinema optics, Biomedical optics and devices, Technology of invention process, Invention problem solving, Cryptographic devices and algorithms, Applied mathematics and physics.

Work Experience:

July 1996–2005 Laser Center of Institute of Fine Mechanics & Optics St. Petersburg, Russia
Senior Researcher

November 2004–November 2005 SAMSUNG ELECTRO-MECHANICS, KOREA
Senior Researcher

- Numerical analysis and experimental research of LED light propagation in scatter materials (Bulk diffusers, Weak diffusers, BEF films, Surface microlens diffusers, Photonic crystals, BEF plates).
- Develop of LED (RGB) backlight (lens and waveguide) optical system to TV.
- Develop methods to increase light efficiency of backlight systems.
- Develop LED optics with phosphor components (3 patents).

May 1999–September 2012: National Research University of Information Technologies, Mechanics & Optics (Institute of Fine Mechanics & Optics) , St. Petersburg, Russia
Senior researcher, Principal researcher, Associate professor: Department of Quantum Electronics & Biomedical Optics.

Principal researcher, associate professor: Department of photonics and optoinformatics (from 2006)

1997 – 2002: Palomar Medical Technologies, Inc. (USA)
R&D of laser and biomedical optics, solver of inventive problems.

1998 – 2004 : JSC "LC" (Russia)
R&D of laser and biomedical optics, solver of inventive problems.

2001 – present: VIGITEK Inc. (USA)
R&D manager and adviser, product design and prototyping, solver of inventive problems.

2001 – present: JSC «Optica-Elite» (Russia)
Optical adviser, lens design for professional cinema applications

2008 : JSC "RRI" Electronstandart " (Russia)
Optical adviser, optical design for Lidar system

2010 – 2011: JSC «Kinotechnika» (Russia)
Lens design for professional cinema applications.

2011 – 2014: Slow Motion, Inc. (USA)
Optical adviser, lens design for professional cinema applications

2009 – present: Ioffe Physical-Technical Institute of the Russian Academy of Sciences
Periodic projects: Solver of inventive problems, lens design for biomedical applications, design of LED optics

July 2013 – present: Opto-mechanical systems Limited (Russian Federation)
Chief Technical Officer

Some Performed projects:

- Develop of UV laser systems for ophthalmology.
- Develop of small-size laser ranger systems.
- Develop of high precision optical systems to microelectronics and nanoelectronics.
- Project leader of research program: theory of high-resolution microscopy to nanotechnology; theory of diffraction light in non-linear scatter medium; Optical systems to genetic research and apparatus to manipulation with selected genes; Optical converters of laser beam profile; High resolution telescopes to satellites.
- Project leader of research program: 4-mirror telescopes.
- Optical design of high resolution and high relative aperture superapochromat objective to 16mm films.
- Optical design of high resolution and high relative aperture superapochromat objective to HDTV films.
- Optical design of high resolution and high relative aperture anamorphic objectives to 35mm films.
- Optical design of high energy diode pumping YAG:Er lasers, include thermal optimization.
- Develop of optical systems of beam transformation to laser diode bars and matrix.
- Develop of optical software for complex thin film coating (include gradient mirrors) with automatic optimization.
- Develop of optical software include thermal, diffraction and non-linear optics calculations.
- Project leader of development program: high power laser optical system to skin treatment with variable spot size on target.

- Diffraction theory of single photon propagation in turbid mediums.
- Creation and develop theory of "optimal optical systems".
- Develop of numerical methods to fast optimizations of color light distributions in volumetric scatter materials.
- Develop of diamond cutting laser system (for Vigitek inc., USA)
- Develop lamp skin treatment biomedical systems (for Vigitek inc., USA)
- Develop new technologies and optical systems for dermatology and cosmetics (hair removal, skin rejuvenescence).
- Develop of optical systems hair removal devices based on solid state and diode lasers.
- Develop of optical systems to Palomar Medical inc. (USA): EpiLaser™ , Q-YAG5™ , RD-1200™, SLP1000™, E2000™, All-Clear™ Package, EsteLux™.
- Developed lasers for LIDAR systems.
- Develop of fiber-optic systems for laser pumping.
- Develop of optical systems to pumping of high power solid-state lasers.
- Develop of software to optical design and thermal design.
- Organized production of optical components and devices.
- Develop of optical systems and thermal design of skin treatment systems based on halogen lamp.
- Develop of optical systems of "intellectual" illumination for medical applications (For Submicron Heterostructures for Microelectronics Research and Engineering Center of the RAS (earlier Ioffe Institute Submicron Heterostructures for Microelectronics Research and Engineering Center)).
- Develop of optical systems of high resolution contact microscopes.
- Develop of optical systems for high power multilamp Nd glass lasers
- Develop of LIDAR optical systems (for atmospheric clean control).
- Develop of optical systems for high definition laser TV.
- Develop of optical systems of stereo-lens (and assembly technology) for (system STEREO-70) for professional cinema high definition digital cameras.
- Develop of optical systems of stereo-lens with changeable basis.
- Develop of optical systems and assembly technology for 2/3" HDTV professional cinema cameras.
- Develop of anamorphic optical systems for professional cinema super high definition digital cameras (4K, 8K)
- Develop of optical systems and assembly technology for APS-C (4K) and 8K cameras.
- Develop of optical systems - converters of cinema formats.
- Develop of scanning type optical systems for 70mm cinema films.
- Develop of technological process manufacture of optical systems for photoepilators with contact cooling (for Vigitek inc., USA).
- Develop of small laser device for biomedical applications.
- Develop of optical system and assembly technology for 193 nm high definition lithography.
- Develop of compact tunable CO laser.
- Develop of high resolution multispectral (from UV to deep IR) telescopes for small satellite system.
- Develop of compact fast cryptographic device.
- Develop of compact fiber zoom handpiece for skin treatment with unmovable optics (for Vigitek inc., USA).
- Develop of compact high power multipurpose zoom handpiece for skin treatment with refraction microlens or diffraction plates for Vigitek inc., USA).
- Develop, manufacturing and assembling of augmented reality glasses.

Certificates and awards:

1. Winner of an award (first place), Physics contest of high-school students (St. Petersburg, IFMO) 1996.
2. Winner of an award (second place) Competition of the scientific and technical journal "World of Technics of Cinema", Moscow, 28 april 2010.
3. Medal European scientific and industrial consortia - "Wilhelm Leibniz".

Participation in public organizations:

1. IEEE.
2. The Russian Academy of Natural History.

Main Conferences:

TPC Chair: INTERNATIONAL WORKSHOP ON OPTICAL NETWORKING TECHNOLOGIES AND DATA SECURITY (from 2009).

TPC: ICUMT (International Congress on Ultra Modern Telecommunications and Control Systems). International Optical Design Seminar. (from 2009).

ISBEIA 2014

ICOST 2014

i-CADER 2014, 2015

CSSR 2015- SoBeS-Social and Behavioural Science

InConSET2016

IEEE TENSYP 2017

ICACCI-2018

InConSET 2018

SIRS-2018

AIECon 2018

Reviewer at (some):

International Conference on Photonics.

International Colloquium of Art and Design Education Research.

IEEE TENSYP'14.

IEEE Innovative Smart Grid Technologies Conference - Asia (ISGT ASIA).

IEEE Colloquium on Humanities, Science and Engineering.

AAGBS International Conference on Business Management (AiCoBM 2014).

IEEE Conference on Clean Energy and Technology.

IEEE Symposium on Business, Engineering and Industrial Applications.

IEEE Business Engineering and Industrial Applications Colloquium.

IEEE Symposium on Industrial Electronics & Applications.

International Civil and Infrastructure Engineering Conference (InCIEC).

SYMINTeCH'2018

ICEED2018

RICCES'2019

ARAMSE'2019

ICEECE'2019

ICACCP-2019