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Curriculum Vitae

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The Cyprus Institute
Energy, Environment and Water Research Center
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Cyprus

Education:

2009 - 2012 PhD in Optics / [Max Planck Institute for the Science of Light](#) (Erlangen, Germany)

1999 - 2004 MSc in Optics / [Belarusian State University](#) (Minsk, Belarus)

Professional Experience:

since 2018 Assistant Professor, [The Cyprus Institute](#) (Nicosia, Cyprus)
Energy, Environment and Water Research Center

2014 - 2017 Postdoctoral researcher, [CSIRO Energy Centre](#) (Newcastle, Australia)
Australian Solar Thermal Research Initiative

2012 - 2014 Postdoctoral researcher, [Fresnel Institute](#) (Marseille, France)
Research group: Control of Light and Radiation Analysis

2009 - 2012 PhD student, [Max Planck Institute for the Science of Light](#) (Erlangen, Germany)
Research group: Nonlinear Photonic Nanostructures

2004 - 2008 Junior researcher, [B. I. Stepanov Institute of Physics](#) (Minsk, Belarus)
Laboratory of Optical Holography

Research Experience:

Solar energy, concentrated solar thermal technologies, heliostats

Integrated optics, photonic crystals, photonic devices

Fiber optics, photonic crystal fibers, nonlinear optics

Metamaterials, thin films, quasicrystals

Light scattering, nanophotonics, plasmonics

Other Skills:

Software development (C++, Python, Qt Framework, CAD tools)

Computer graphics (OpenGL, ray tracing, 3D engines)

Numerical methods

Publications:

- [1] V. Grigoriev, K. Milidonis, M. Constantinou, C. Corsi, J. Pye, M. Blanco, "Optimal sizing of cylindrical receivers for surround heliostat fields using FluxTracer," [submitted to Journal of Solar Energy Engineering \(2021\)](#).
- [2] K. Milidonis, A. Bonanos, M. Blanco, V. Grigoriev, D. Abate, I. Iakovou, "Heliostat geometrical characterization by UAV-assisted photogrammetry," [submitted to Solar Energy \(2021\)](#).
- [3] K. Milidonis, C. Panagiotou, A. Bonanos, M. Constantinou, V. Grigoriev, M. Blanco, J. Pye, C. Asselineau, "Review of application of AI techniques to Solar Tower Systems," [submitted to Solar Energy \(2021\)](#).
- [4] V. Grigoriev, K. Milidonis, M. Blanco, M. Constantinou, "Method to determine the tracking angles of heliostats," [MethodsX 8, 101244 \(2021\)](#).
- [5] V. Grigoriev, K. Milidonis, M. Blanco, "Sun tracking by heliostats with arbitrary orientation of primary and secondary axes," [Solar Energy 207, 1384-1389 \(2020\)](#).
- [6] M. Blanco, M. Constantinou, C. Corsi, V. Grigoriev, K. Milidonis, C. Panagiotou, C. Papanicolas, J. Pye, E. Votyakov, "FluxTracer: a ray tracer post-processor to assist in the design and optimization of solar concentrators and receivers," [Journal of Solar Energy Engineering 141, 021015 \(2019\)](#).
- [7] M. Blanco, M. Constantinou, C. Corsi, V. Grigoriev, K. Milidonis, C. Panagiotou, C. Papanicolas, J. Pye, E. Votyakov, "Analysis of the focal region of the heliostat field of the ASTRI reference plant with FluxTracer," [AIP Conference Proceedings 2126, 170002 \(2019\)](#).
- [8] V. Grigoriev and C. Corsi, "Unified algorithm of cone optics to compute solar flux on central receiver," [AIP Conference Proceedings 1850, 030021 \(2017\)](#).
- [9] V. Grigoriev, C. Corsi, M. Blanco, "Fourier sampling of sun path for applications in solar energy," [AIP Conference Proceedings 1734, 020008 \(2016\)](#).
- [10] J. Coventry, M. Arjomandi, J. Barry, M. Blanco, G. Burgess, J. Campbell, P. Connor, M. Emes, P. Fairman, D. Farrant, F. Ghanadi, V. Grigoriev, C. Hall, P. Koltun, D. Lewis, S. Martin, G. Nathan, J. Pye, A. Qiu, W. Stuart, Y. Tang, F. Venn, J. Yu, "Development of the ASTRI Heliostat," [AIP Conference Proceedings 1734, 020005 \(2016\)](#).
- [11] C. Corsi, V. Grigoriev, M. Blanco, "Far-field optimisation of heliostat shape and spacings," [Proceedings APSRC \(2015\)](#).
- [12] V. Grigoriev, J. Wenger, N. Bonod, B. Stout, "Optimizing nanoparticle designs for ideal absorption of light," [ACS Photonics 2, 263-270 \(2015\)](#).
- [13] J. Torres, P. Ghenuche, S. B. Moparthy, V. Grigoriev, J. Wenger, "FRET enhancement in aluminum zero-mode waveguides," [Chem. Phys. Chem. 16, 782-788 \(2015\)](#).
- [14] P. Ghenuche, J. Torres, S. B. Moparthy, V. Grigoriev, J. Wenger, "Nanophotonic enhancement of the Förster resonance energy-transfer rate with single nanoapertures," [Nano Lett. 14, 4707-4714 \(2014\)](#).
- [15] V. Grigoriev, G. Demésy, J. Wenger, N. Bonod, "Singular analysis to homogenize planar metamaterials as nonlocal effective media," [Phys. Rev. B 89, 245102 \(2014\)](#).
- [16] D. Punj, P. Ghenuche, S. B. Moparthy, J. Torres, V. Grigoriev, H. Rigneault, J. Wenger, "Plasmonic antennas and zero-mode waveguides to enhance single molecule fluorescence detection and fluorescence correlation spectroscopy toward physiological concentrations," [Nanomed. Nanobiotechnol. 6, 268-282 \(2014\)](#).

- [17] V. Grigoriev and F. Biancalana, "Nonlinear aperiodic multilayers: Recent advances in theory and modeling," in *Optics of Aperiodic Structures* (Pan Stanford Publishing, Stanford, 2013).
- [18] V. Grigoriev, S. Varault, G. Boudarham, B. Stout, J. Wenger, N. Bonod, "Singular analysis of Fano resonances in plasmonic nanostructures," *Phys. Rev. A* **88**, 063805 (2013).
- [19] V. Grigoriev, A. Tahri, S. Varault, B. Rolly, B. Stout, J. Wenger, N. Bonod, "Optimization of resonant effects in nanostructures via Weierstrass factorization," *Phys. Rev. A (Rapid Communications)* **88**, 011803 (2013).
- [20] V. Grigoriev and F. Biancalana, "Exact analytical representations for broadband transmission properties of quarter-wave multilayers," *Opt. Lett.* **36**, 3774-3776 (2011).
- [21] V. Grigoriev and F. Biancalana, "Coupled-mode theory for on-channel nonlinear microcavities," *J. Opt. Soc. Am. B* **28**, 2165-2173 (2011).
- [22] V. Grigoriev and F. Biancalana, "Nonreciprocal switching thresholds in coupled nonlinear microcavities," *Opt. Lett.* **36**, 2131-2133 (2011).
- [23] V. Grigoriev and F. Biancalana, "Resonant self-pulsations in coupled nonlinear microcavities," *Phys. Rev. A* **83**, 043816 (2011).
- [24] V. Grigoriev and F. Biancalana, "Bistability, multistability and non-reciprocal light propagation in Thue-Morse multilayered structures," *New J. Phys.* **12**, 053041 (2010).
- [25] V. Grigoriev and F. Biancalana, "Bistability and stationary gap solitons in quasiperiodic photonic crystals based on Thue-Morse sequence," *Photonics Nanostruct. Fundam. Appl.* **8**, 285-290 (2010).
- [26] V. Grigoriev and V. Kabanov, "Propagation of localized wave packet in metamaterial with negative index of refraction," *J. Appl. Spectrosc.* **75**, 192-198 (2008).

Presentations and Outreach:

- [27] K. Milidonis, M. Blanco, A. Bonanos, V. Grigoriev, M. Constantinou, M. Collares-Pereira, C. Papanicolas, J. Pye, C. Asselineau, "Automated design of the Cyprus Institute's nonimaging high-flux facility using novel open source software tools and strategies," poster at *SolarPACES* (Daegu, South Korea, 1 - 4 October 2019).
- [28] M. Blanco, C. Corsi, M. Constantinou, V. Grigoriev, K. Mildonis, C. Panagiotou, C. Papanicolas, J. Pye, E. Votyakov, "Analysis of the focal region of the heliostat field of the ASTRI reference plant with FluxTracer," talk at *SolarPACES* (Casablanca, Morocco, 2 - 5 October 2018): *AIP Conference Proceedings* **2126**, 170002 (2019).
- [29] V. Grigoriev, "Optics of heliostat fields," invited talk at *Networking for Excellence in Solar Thermal Energy Research* (Nicosia, Cyprus, 26 November 2018).
- [30] V. Grigoriev and C. Corsi, "Unified algorithm of cone optics to compute solar flux on central receiver," talk at *SolarPACES* (Abu Dhabi, UAE, 11 - 14 October 2016): *AIP Conference Proceedings* **1850**, 030021 (2017).
- [31] V. Grigoriev, C. Corsi, M. Blanco, "Fourier sampling of sun path for applications in solar energy," talk at *SolarPACES* (Cape Town, South Africa, 13 - 16 October 2015): *AIP Conference Proceedings* **1734**, 020008 (2016).
- [32] J. Coventry, M. Arjomandi, J. Barry, M. Blanco, G. Burgess, J. Campbell, P. Connor, M. Emes, P. Fairman, D. Farrant, F. Ghanadi, V. Grigoriev, C. Hall, P. Koltun, D. Lewis, S. Martin, G. Nathan, J. Pye, A. Qiu, W. Stuart, Y. Tang, F. Venn, J. Yu, "Development of the ASTRI Heliostat," poster at *SolarPACES* (Cape Town, South Africa, 13 - 16 October 2015): *AIP Conference Proceedings* **1734**, 020005 (2016).
- [33] C. Corsi, V. Grigoriev, M. Blanco, "Far-field optimisation of heliostat shape and spacings," talk at *Asia-Pacific Solar Research Conference* (Brisbane, Australia, 8 - 10 December): *Proceedings APSRC* (2015).

- [34] B. Stout, N. Bonod, J. Wenger, V. Grigoriev, "Ideal absorption design in nanoparticles," poster at *Laser-light and Interactions with Particles* (Marseille, France, 25 - 29 August 2014).
- [35] V. Grigoriev, B. Stout, J. Wenger, N. Bonod, "Spectral analysis of Fano resonances in core-shell and dolmen plasmonic nanostructures," invited talk at *Metamaterials, Photonic Crystals and Plasmonics* (Singapore, 20 - 23 May, 2014).
- [36] V. Grigoriev, S. Varault, B. Rolly, B. Stout, J. Wenger, N. Bonod, "Geometrical interpretation of Fano resonances in plasmonic nanostructures," poster at *Summer School on Plasmonics* (Cargèse, France, 28 July - 3 August 2013).
- [37] V. Grigoriev, A. Tahri, S. Varault, B. Rolly, B. Stout, J. Wenger, N. Bonod, "Decomposition of Mie scattering coefficients and polarizabilities of nanoshell structures into Lorentzian resonances," talk at *Optical Wave Theory and Numerical Modelling* (Enschede, Netherlands, 19 - 20 April 2013).
- [38] V. Grigoriev and F. Biancalana, "Broadband transmission properties of multilayered structures," talk at *Photonics and Microsystems* (Cottbus, Germany, 8 - 10 July 2011).
- [39] V. Grigoriev and F. Biancalana, "Nonlinear optical diode based on nonreciprocal cross-phase modulation in coupled microcavities," talk at *Conference on Lasers and Electro-Optics*, (Munich, Germany, 22 - 26 May 2011).
- [40] V. Grigoriev and F. Biancalana, "Generation of ultrashort pulses via self-pulsations in coupled nonlinear microcavities," talk at *Theoretical and Computational Nanophotonics* (Bad Honnef, Germany, 3 - 5 November 2010): [AIP Conference Proceedings 1291, 58-60 \(2010\)](#).
- [41] V. Grigoriev and F. Biancalana, "Bistability, multistability and nonreciprocal light propagation in Thue-Morse multilayers," poster at *Nonlinear Photonics* (Karlsruhe, Germany, 21 - 24 June 2010).
- [42] V. Grigoriev and F. Biancalana, "Bistability and stationary gap solitons in quasiperiodic photonic crystals based on Thue-Morse sequence," talk at *Theoretical and Computational Nanophotonics* (Bad Honnef, Germany, 28 - 30 October 2009): [AIP Conference Proceedings 1176, 66-68 \(2009\)](#).
- [43] V. Grigoriev and V. Kabanov, "Propagation of wave packets in a medium with negative index of refraction," talk at *Physics of pulse discharges in condensed media* (Nikolaev, Ukraine, 21 - 25 August 2007).