

Phil Ahrenkiel

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Education

1995 *Ph.D., Physics*, [University of Colorado](#), Boulder, Colorado

Thesis Title: Phase Separation and Atomic Ordering in Epitaxial Semiconductor Alloys Studied by Transmission Electron Microscopy#

1991 *M. S., Physics*, [Colorado School of Mines](#), Golden, Colorado

Thesis Title: Intercalation Processes in Layered Silicates and High-Tc Superconducting Oxides Studied by X-Ray Diffraction#

1987 *B. S., Engineering Physics*, [University of Colorado](#), Boulder, Colorado

Employment

[SPAhrenTech](#), Arvada, Colorado

Physicist/Programmer (Oct. 2023-present)

- I develop physics-based [software](#) inspired by both my research interests and entertainment. I have vast experience in materials analysis using transmission electron microscopy, and I am deeply familiar with nano- materials, electronics, and characterization.

[Big Ladder Software](#), Denver, Colorado

Computational Scientist (Jun. 2023-Oct. 2025)

- My main project was development of a heat-pump-water-heater simulation [library](#) used by the California Energy Commission for compliance calculations. I generalized and restructured large segments of the code, with emphasis on physical rigor, while maintaining hundreds of unit and function tests. I implemented a formal data representation to allow external entry of manufacturer models as JSON. I added independently an interactive suite of graphical analysis apps using [Plotly Dash](#), used to refine simulation parameters for new manufacturer models, and created a header-only [library](#) for a physical-units agnostic API.
- I created a [data-conversion library](#) for users of the legacy California Utility Allowance Calculator Access databases to extract data via SQL.
- I added load-groups and other requested features to an [energy-resilience simulation](#) library, used for catastrophic analysis of large-scale installations (e.g., military bases, universities).
- I presented a requested in-depth comparison of evaluation methods for a C++ [interpolation library](#) and generated documentation.
- I developed a [boost utility script](#) that swaps and minimizes boost versions.

[Maptek](#), Golden, Colorado

Software Engineer (Apr. 2022-Feb. 2023)

- I provided maintenance on [Vulcan](#) software, fixing defects and creating unit tests, using a JIRA-based review system, with Mercurial for version control.
- In response to a user story, I added the ability to import large, [geo-tagged TIFF files](#), by expanding the extant libTIFF driver and developing a novel [algorithm](#) to generate optimized, topographical

triangulations with variable resolution.

Epilog, Golden, Colorado

Laser Alignment Technician (Oct. 2021-Apr. 2022)

- I worked in a manufacturing environment to perform alignment of new and repaired CO2 lasers for laser cutting/engraving systems.

South Dakota School of Mines, Rapid City, South Dakota

Nanoscience & Nanoengineering Ph.D. Program

Professor (Aug 2017-Jul 2021)

- My group worked on the optimization of ordered, metamorphic III-V films for red/amber LEDs. We demonstrated ordered/disordered epitaxial homostructures using a plasma-enhanced MOCVD [method](#). We measured the [strength of ordering](#) in these films by a precession-diffraction method, using automated alignment and acquisition. The patterns were refined to [dynamical simulations](#).
- Using [plasma-enhanced MOCVD](#), we demonstrated epi-Al films on GaAs substrates and control of order/disorder in III-V alloy epilayers.
- I contributed to a state-wide bio-imaging center supported through NSF. I advised graduate students on TEM analysis of mutated [cellular](#) structures. I advised a [student](#) on the use TEM to reconstruct the localized biological features prepared by [ultramicrotomy].
- I created additional special-topics [courses](#) to meet graduate-research needs.
- I wrote a [Digital Micrograph script manager](#) and supporting plug-ins to improve the user experience and facilitate data archiving for the JEM-2100 transmission electron microscope, and to integrate automation of techniques (e.g., [montaging](#)).
- I served on several academic and campus committees, including University Research, Promotion & Tenure, Risk Management, Parking Appeals.

Associate Professor (Aug 2012-Jul 2017)

- In a DOE partnership [support](#), we developed PE-MOCVD to explore synthesis at far-from-equilibrium conditions. We synthesized high-mobility epi-GaAs [films](#) on flexible metal substrates, which were proposed for multijunction III-V devices. We confronted the central challenge of defect propagation in these materials with a broad range of innovative growth experiments.
- We developed a focused-jet electrospinning [method](#) for controlled synthesis of loaded polymeric nanofibers.

Assistant Professor (Aug 2006- Jul 2012)

- I developed the core nanocharacterization graduate [course](#), and wrote a complete series of instructional experiments for that course to utilize instrumentation across campus. I taught all core courses for the program, and created elective courses on [crystallography](#), [nanomaterials](#), [photovoltaics](#), and [nanoelectronics](#). I also offered several selected topics [courses](#) in support of graduate research. I created an undergraduate nanoscience [course](#).
- I managed the legacy Hitachi transmission electron microscope and trained users. I added digital acquisition capability, and facilitated and coordinated access and training for student research throughout the state.

- I proposed the acquisition of the high-resolution JEOL TEM instrument, and oversaw the design, excavation, and renovation of specialized laboratory space for mechanical isolation of the instrument.
- I supported and advised student research through a university/DOE national laboratory [partnership](#). We modified a home-built metalorganic chemical vapor deposition system to synthesize epitaxial films of III-V compound semiconductors engineered for multi-junction photovoltaics. For over a decade, the MOCVD system was used for student research and external collaboration, with extensive hardware and [software](#) customization. The inherent risks of MOCVD demanded attention to safety protocols and development of a hazard communication [system](#).
- We developed a computational method to extract alloy [compositions](#) of alloy films from energy-dispersive X-ray spectrometry. We also applied convergent-beam electron [diffraction](#) to metamorphic alloy films, to probe both composition and strain.
- Through a collaboration with [Vinča](#) Institute, I investigated a broad range of metal and rare-earth oxide nanomaterials.

National Renewable Energy Laboratory, Golden, Colorado

National Center for Photovoltaics

Senior Scientist I (2001-2006)

- I identified the optimization criteria of compositional [grades](#) used for metamorphic, semiconductor heterostructures with world-record photovoltaic and thermophotovoltaic device efficiencies. Based on experimental investigations, I developed a detailed physical model of the relaxation behavior in the metamorphic grades that enable this technology.
- I designed and constructed a tunable light source to bias tandem solar cells during testing.
- My team studied the recrystallization phase-change kinetics of hydrogenated amorphous Si on glass substrates for low-cost photovoltaic applications. Time-series data were
- I supported the NREL Bioenergy Center by imaging carbon nanotubes and cellulose fibers used as templates for nanoparticle self-assembly.
- I used TEM [tomography](#) to elucidate the shapes and configurations of nanoparticles and ensembles.

Scientist II (1998-2001)

- I worked closely with colloidal chemists to provide TEM characterization of semiconductor and metal nanoparticles. I supported NREL projects on various renewable-energy materials: CuInSe_2 , Li:CoO_2 , VO_x , BaSrTiO_3 , and organic hybrids.
- I elucidated the dark-field imaging signatures of antiphase boundaries in ordered materials, and identified unique properties and physical origins of APBs in single-variant GaInAs .

Postdoctoral Scientist (1995-1998)

- I supported Basic Energy Sciences projects by using TEM to study ordered domain structures and composition modulation in epitaxial III-V semiconductor alloys and short-period superlattices. We discovered a strong nanowire formation driven by lateral modulation in short-period [superlattices](#).
- I generated theoretical models for TEM image contrast of partially ordered structures and modulated superlattices. I developed dynamical electron-diffraction software routines for

experiment simulation and computational analysis of ordered structures.

- I provided TEM analysis of a broad range single- and poly-crystalline thin-film materials, such as YBCO, ZnO, SiN, and Ge.

Graduate Research Assistant (1989–1991)

- I enrolled in the Physics Ph.D. program at CU, Boulder, and received GRA support at NREL, to study atomic ordering phenomena in II-VI and III-V epitaxial semiconductor alloys. Spontaneous ordering has potentially useful influences on the optoelectronic properties of these materials. In collaboration with the University of Notre Dame, we discovered a novel form of [composition modulation](#) in $\text{ZnSe}_{1-x}\text{Te}_x$ films that highlighted growth instabilities.

[Colorado School of Mines](#), Golden, Colorado

[Physics Department](#)

Graduate Research Assistant (1989–1991)

- I used X-ray diffraction to probe structural transitions during water intercalation in layered-silicate minerals. We applied similar methods to the copper-oxide superconductors, for which some forms also exhibit intercalation behavior.
- The software to run the four-circle X-ray diffractometer was limited when I started. I wrote a programmable XRD data acquisition/analysis software package.

[CERN](#), Geneva, Switzerland

NA36 Experiment

Summer Student (June–Aug., 1987)

- I assisted with installation of a time-projection chamber used in an SPS collider experiment.
- I procured and installed FASTBUS data-acquisition electronics, and wrote a test program.

Courses Instructed

SDSMT (2006-2021)

- NANO 703/703L-Instrumentation for Characterization of Nanomaterials (3/1 cr): FA(06-16)<#>
- NANO 704-Crystallography and Structure of Nanomaterials (3 cr): SP(07, 09, 11, 13, 16)<#>
- NANO 705-Nanoelectronic Materials (3 cr): SP(09, 14, 17, 20)<#>
- NANO 708-Nanomaterials for Photovoltaics (3 cr): SP(08, 12, 15, 18)<#>
- NANO 401-Introduction to Nanoscience (3 cr): SP11
- NANO 701-Nanomaterials (3 cr): SP10
- NANO 702-Theory and Applications of Nanomaterials (3 cr): FA19
- NANO 791-Ordered Semiconductors for Optoelectronics (1 cr): FA18<#>
- NANO 791-MOCVD (1 cr): FA10
- NANO 792-Defects in Nanomaterials (3 cr): SP20<#>

[Front Range Community College](#)

- PHY 211-Calculus-Based Physics II (5 cr): FA05
- PHY 212-Calculus-Based Physics II (5 cr): SP(00, 01, 04)

Community College of Denver

- PHY 105-Conceptual Physics (3 cr): SP90~FA94

Special Skills and Training

- Advanced transmission electron imaging and diffraction of electronic materials.
- Cryo-ultramicrotome preparation and electron tomography of biomaterials.
- X-ray diffraction of nanoparticles and thin films.
- Dislocations and strain-relaxation analysis of epitaxial layers.
- Materials and device engineering and characterization.
- Semiconductor crystal growth.
- Vacuum system design and maintenance.
- Scientific computer programming (C++, Objective C, Swift, MatLab, LabView, Igor, Digital Micrograph, Python); IDEs: VSCode, Xcode, CLion
- Experiment automation; digital image processing; computational analysis and simulation.
- Mac OS, Windows, and Linux operating-system experience.
- Technical writing proficiency.
- Graduate and undergraduate teaching.

Professional Memberships

- [American Physical Society](#)
- [Microscopy Society of America](#)
- [Materials Research Society](#)

Grants Awarded

- U.S. Dept. of Energy, "Non-equilibrium synthesis of epitaxial semiconductors for energy applications", Award DE-SC0019430, 2018, \$750K.<#>
- U.S. Dept. of Energy, "Aluminum epilayers for controlled growth and processing of high-efficiency, low-cost III-V solar cells", Award DE-EE0007363, 2016, \$205K.<#>
- U.S. Dept. of Energy, "High-Efficiency, Inexpensive Thin Film III-V Photovoltaics using Single-Crystalline Like, Flexible Substrates", 2014, Univ. of Houston, (\$400K-SDSMT).
- U.S. Nat'l. Science Foundation, "MRI: Acquisition of a Modern Transmission Electron Microscope for Research and Training in South Dakota", Award CBET-0923483, 2009, \$699K.<#>
- U.S. Dept. of Energy, "Lattice-Mismatched III-V Epilayers for High-Efficiency Photovoltaics", 2007, \$450K.

- State of South Dakota, Governor's 2010 Individual Research Seed Grant Program, "Growth Kinetics During Recrystallization of Amorphous Silicon", 2008, \$23,888.
- SDSMT Council of Graduate Education, Nelson Research Grant, "Structural Characterization of Carbon and Ceramic Nanofibers", 2008, \$5000.
- NREL Director's Discretionary Research Fund, "Shape and Crystallography of III-V Semiconductor and Metal Nanoparticles", 2004, \$120K.

Book

- Richard K Ahrenkiel and S Phil Ahrenkiel, Theory and methods of photovoltaic material characterization, WORLD SCIENTIFIC, 2019.<#>

Book Chapter

- S. P. Ahrenkiel, "Diffraction and imaging of ordered semiconductors", in A. Mascarenhas (Ed.), Spontaneous ordering in semiconductor alloys, Kluwer Academic, 2002, pp. 195–233.<#>

Inventions

- Kirstin Alberi, Christopher Leo STENDER, and Scott Phillip AHRENKIEL, "Patent application: Strain balanced direct bandgap aluminum indium phosphide quantum wells for light emitting diodes", (2022). <#>
- Phil Ahrenkiel and Nathan Smaglik, "Invention disclosure: Plasma-enhanced metalorganic chemical vapor deposition of aluminum", (2017).
- Phil Ahrenkiel and Srujan Mishra, "Invention disclosure: Modified electrospinning process for controlled deposition of nanofibers by focused electric field", (2013).
- Mark W. Wanlass and S. Phillip Ahrenkiel, "Patent application: Method for achieving device-quality, lattice-mismatched, heteroepitaxial active layers", (2006) 1–12. <#>

Publications

1. Emily S. Kessler-Lewis, Stephen J. Polly, George T. Nelson, Michael A. Slocum, Nikhil Pokharel, Phil Ahrenkiel, and Seth M. Hubbard, "Development of MOVPE grown GaSb-on-GaAs interfacial misfit solar cells", *Journal of Applied Physics* **133** (2023).<#>
2. Stephen Polly, Brandon Bogner, Anastasiia Fedorenko, Nikhil Pokharel, Phil Ahrenkiel, Subhra Chowdhury, Dhruves Biswas, and Seth Hubbard, "Growth optimization of quantum-well-enhanced multijunction photovoltaics", *Cell Reports Physical Science* **4** (2023) 101432.<#>
3. Xavier Pasala, Nikhil Pokharel, Phil Ahrenkiel, Kirstin Alberi, Kamran Forghani, and Chris Stender, "Quantitative order-parameter measurement in lattice-mismatched AlInP using precession electron diffraction", *Journal of Microscopy* **284** (2021) 132–141.<#>
4. Jinyuan Liu, Lin Kang, Ishara Ratnayake, Phil Ahrenkiel, Steve Smith, and Congzhou Wang, "Targeting cancer cell adhesion molecule, CD146, with low-dose gold nanorods and mild hyperthermia disrupts actin cytoskeleton and cancer cell migration", *Journal of Colloid and Interface Science* **601** (2021) 556–569.<#>
5. Vesna Lazić, Vera Vivod, Zdenka Peršin, Milovan Stojiljković, Ishara S. Ratnayake, Phillip S. Ahrenkiel, Jovan M. Nedeljković, and Vanja Kokol, "Dextran-coated silver nanoparticles for improved barrier

and controlled antimicrobial properties of nanocellulose films used in food packaging", *Food Packaging and Shelf Life* **26** (2020) 100575.<#>

6. Zuzana Barbieriková, Davor Lončarević, Jelena Papan, Ivana D. Vukoje, Milovan Stoiljković, S. Phillip Ahrenkiel, and Jovan M. Nedeljković, "Photocatalytic hydrogen evolution over surface-modified titanate nanotubes by 5-aminosalicylic acid decorated with silver nanoparticles", *Advanced Powder Technology* **31** (2020) 4683–4690.<#>
7. Karla L. Otterpohl, Brook W. Busselman, Ishara Ratnayake, Ryan G. Hart, Kimberly R. Hart, Claire M. Evans, Carrie L. Phillips, Jordan R. Beach, Phil Ahrenkiel, Bruce A. Molitoris, Kameswaran Surendran, and Indra Chandrasekar, "Conditional Myh9 and Myh10 inactivation in adult mouse renal epithelium results in progressive kidney disease", *JCI Insight* **5** (2020).<#>
8. Malini Mukherjee, Ishara Ratnayake, Madhusudhana Janga, Eric Fogarty, Shania Scheidt, Justin Grassmeyer, Jennifer deRiso, Indra Chandrasekar, Phil Ahrenkiel, Raphael Kopan, and Kameswaran Surendran, "Notch signaling regulates *Akap12* expression and primary cilia length during renal tubule morphogenesis", *The FASEB Journal* **34** (2020) 9512–9530.<#>
9. Nathan Smaglik, Nikhil Pokharel, and Phil Ahrenkiel, "Applications of plasma-enhanced metalorganic chemical vapor deposition", *Journal of Crystal Growth* **535** (2020) 125544.<#>
10. Ram Saraswat, Ishara Ratnayake, E. Celeste Perez, William M. Schutz, Zhengtao Zhu, S. Phillip Ahrenkiel, and Scott T. Wood, "Micropatterned biphasic nanocomposite platform for maintaining chondrocyte morphology", *ACS Applied Materials & Interfaces* **12** (2020) 14814–14824.<#>
11. Divya Kota, Ishara S. Ratnayake, Lin Kang, Phil Ahrenkiel, Congzhou Wang, Scott Wood, and Steve Smith, "Single molecule force spectroscopy of chondrocyte $\alpha 5\beta 1$ and $\alpha 1\beta 1$ integrins", *Biophysical Journal* **118** (2020) 93a–94a.<#>
12. M. Miljković, V. Lazić, S. Davidović, A. Milivojević, J. Papan, M. M. Fernandes, S. Lanceros-Mendez, S. P. Ahrenkiel, and J. M. Nedeljković, "Selective antimicrobial performance of biosynthesized silver nanoparticles by horsetail extract against *e. coli*", *Journal of Inorganic and Organometallic Polymers and Materials* **30** (2020).<#>
13. Slađana Davidović, Vesna Lazić, Miona Miljković, Milan Gordić, Milica Sekulić, Milena Marinović-Cincović, Ishara S. Ratnayake, S. Phillip Ahrenkiel, and Jovan M. Nedeljković, "Antibacterial ability of immobilized silver nanoparticles in agar-agar films co-doped with magnesium ions", *Carbohydrate Polymers* **224** (2019) 115187.<#>
14. Dušan K. Božanić, Gustavo A. Garcia, Laurent Nahon, Dušan Sredojević, Vesna Lazić, Ivana Vukoje, S. Phillip Ahrenkiel, Vladimir Djoković, Željko Šljivančanin, and Jovan M. Nedeljković, "Interfacial charge transfer transitions in colloidal TiO₂ nanoparticles functionalized with salicylic acid and 5-aminosalicylic acid: A comparative photoelectron spectroscopy and DFT study", *The Journal of Physical Chemistry C* **123** (2019) 29057–29066.<#>
15. Marija Prekajski Đorđević, Ivana Vukoje, Vesna Lazić, Vesna Đorđević, Dušan Sredojević, Jasmina Dostanić, Davor Lončarević, S. Phillip Ahrenkiel, Milivoj R. Belić, and Jovan M. Nedeljković, "Electronic structure of surface complexes between CeO₂ and benzene derivatives: A comparative experimental and DFT study", *Materials Chemistry and Physics* **236** (2019) 121816.<#>
16. Nikhil Pokharel, Nathan Smaglik, Phil Ahrenkiel, Alessandro Giussani, Michael A. Slocum, and Seth M. Hubbard, "Orientations of Al₄C₃ and Al films grown on GaAs substrates", *Materials Science in Semiconductor Processing* **98** (2019) 49–54.<#>

17. Ivana D. Vukoje, Enis S. Džunuzović, Suzana Dimitrijević, Scott Phillip Ahrenkiel, and Jovan M. Nedeljković, "Size-dependent antibacterial properties of ag nanoparticles supported by amino-functionalized poly(GMA- *<i>co</i></i>* -EGDMA) polymer", *Polymer Composites* **40** (2019) 2901–2907.<#>
18. Malini Mukherjee, Jennifer DeRiso, Karla Otterpohl, Ishara Ratnayake, Divya Kota, Phil Ahrenkiel, Indra Chandrasekar, and Kameswaran Surendran, "Endogenous notch signaling in adult kidneys maintains segment-specific epithelial cell types of the distal tubules and collecting ducts to ensure water homeostasis", *Journal of the American Society of Nephrology* **30** (2019) 110–126.<#>
19. Vesna Lazić, Katarina Mihajlovski, Ana Mraković, Erzsébet Illés, Milovan Stojković, S. Phil Ahrenkiel, and Jovan M. Nedeljković, "Antimicrobial activity of silver nanoparticles supported by magnetite", *Chemistry Select* **4** (2019) 1–8.<#>
20. Geemin Kim, Sol An, Seok Ki Hyeong, Seoung Ki Lee, Myungwoong Kim, and Naechul Shin, "Perovskite pattern formation by chemical vapor deposition using photolithographically defined templates", *Chemistry of Materials* **31** (2019) 8212–8221.<#>
21. J. Milikić, U. Stamenović, V. Vodnik, S. P. Ahrenkiel, and B. Šljukić, "Gold nanorod-polyaniline composites: Synthesis and evaluation as anode electrocatalysts for direct borohydride fuel cells", *Electrochimica Acta* **328** (2019).<#>
22. Sudersena Rao Tatavarti, Zachary S. Bittner, A. Wibowo, Michael A. Slocum, George Nelson, Hyun Kum, S. Phillip Ahrenkiel, and Seth M. Hubbard, "Epitaxial lift-off (ELO) of InGaP/GaAs/InGaAs solar cells with quantum dots in GaAs middle sub-cell", *Solar Energy Materials and Solar Cells* **185** (2018) 153–157.<#>
23. Anurag Chakraborty, Robert Anderson, Scott P. Ahrenkiel, Frank Kustas, and Jason Ash, "Numerical estimation of intrinsic stress in physical vapor deposited thin-films", *Surface and Coatings Technology* **350** (2018) 488–495.<#>
24. Vesna Lazić, Ivana Smičklas, Jelena Marković, Davor Lončarević, Jasmina Dostanić, S. Phillip Ahrenkiel, and Jovan M. Nedeljković, "Antibacterial ability of supported silver nanoparticles by functionalized hydroxyapatite with 5-aminosalicylic acid", *Vacuum* **148** (2018) 62–68.<#>
25. Yongkuan Li, Haichao Guo, Yao Yao, Pavel Dutta, Monika Rath, Nan Zheng, Ying Gao, Sicong Sun, Jae-Hyun Ryou, Phil Ahrenkiel, and Venkat Selvamannickam, "Defect reduction by liquid phase epitaxy of germanium on single-crystalline-like germanium templates on flexible, low-cost metal substrates", *CrystEngComm* **20** (2018) 6573–6579.<#>
26. M. V. Carević, N. D. Abazović, M. N. Mitrić, G. Ćirić-Marjanović, M. D. Mojović, S. P. Ahrenkiel, and M. I. Čomor, "Properties of zirconia/polyaniline hybrid nanocomposites and their application as photocatalysts for degradation of model pollutants", *Materials Chemistry and Physics* **205** (2018) 130–137.<#>
27. Bojana Milićević, Vesna Đorđević, Davor Lončarević, Jasmina M. Dostanić, S. Phillip Ahrenkiel, Miroslav D. Dramićanin, Dušan Sredojević, Nenad M. Švrakić, and Jovan M. Nedeljković, "Charge-transfer complex formation between TiO₂ nanoparticles and thiosalicylic acid: A comprehensive experimental and DFT study", *Optical Materials* **73** (2017) 163–171.<#>
28. Marija Radoičić, Gordana Ćirić-Marjanović, Vuk Spasojević, Phil Ahrenkiel, Miodrag Mitrić, Tatjana Novaković, and Zoran Šaponjić, "Superior photocatalytic properties of carbonized PANI/TiO₂ nanocomposites", *Applied Catalysis B: Environmental* **213** (2017) 155–166.<#>

29. Ivana Smičiklas, Jelena Papan, Vesna Lazić, Davor Lončarević, S. Phillip Ahrenkiel, and Jovan M. Nedeljković, "Functionalized biogenic hydroxyapatite with 5-aminosalicylic acid – sorbent for efficient separation of Pb²⁺ and Cu²⁺ ions", *Journal of Environmental Chemical Engineering* **5** (2017) 3759–3765.<#>
30. Nan Zheng and S. Phillip Ahrenkiel, "Epitaxial nanowire formation in metamorphic GaAs/GaPAs short-period superlattices", *AIP Advances* **7** (2017).<#>
31. Vladan Bajić, Biljana Spremo-Potparević, Lada Živković, Andrea Čabarkapa, Jelena Kotur-Stevuljević, Esma Isenović, Dušan Sredojević, Ivana Vukoje, Vesna Lazić, S. Phillip Ahrenkiel, and Jovan M. Nedeljković, "Surface-modified TiO₂ nanoparticles with ascorbic acid: Antioxidant properties and efficiency against DNA damage in vitro", *Colloids and Surfaces B: Biointerfaces* **155** (2017) 323–331.<#>
32. I Ratnayake, S. P. Ahrenkiel, A. Hoppe, and N. Thiex, "Electron microscopy and tomography on endocytosis of macrophages", *Microscopy and Microanalysis* **23** (2017) 1268–1269.<#>
33. Ivana D. Vukoje, Enis S. Džunuzović, Davor R. Lončarević, Suzana Dimitrijević, S. Phillip Ahrenkiel, and Jovan M. Nedeljković, "Synthesis, characterization, and antimicrobial activity of silver nanoparticles on poly(GMA- *co*-EGDMA) polymer support", *Polymer Composites* **38** (2017) 1206–1214.<#>
34. Jasmina Dostanić, Davor Lončarević, Vesna Đorđević, S. Phillip Ahrenkiel, and Jovan M. Nedeljković, "The photocatalytic performance of silver halides – silver carbonate heterostructures", *Journal of Photochemistry and Photobiology A: Chemistry* **336** (2017) 1–7.<#>
35. Milica V. Carević, Tatjana D. Savić, Nadica D. Abazović, Miodrag N. Mitrić, Zoran A. Stojanović, Scott P. Ahrenkiel, and Mirjana I. Čomor, "Formation of ZnIn₂S₄ nanosheets and tubular structures in organic media", *Materials Research Bulletin* **87** (2017) 140–147.<#>
36. Ivana D. Vukoje, Enis S. Džunuzović, Davor R. Lončarević, Suzana Dimitrijević, S. Phillip Ahrenkiel, and Jovan M. Nedeljković, "Synthesis, characterization, and antimicrobial activity of silver nanoparticles on poly(GMA-*co*-EGDMA) polymer support", *Polymer Composites* **2017** (2017) 1206.<#>
37. Gordana Bogdanovic, Tijana Kovac, Enis Džunuzovic, Milena Spírková, Phillip Ahrenkiel, and Jovan Nedeljkovic, "Influence of hematite nanorods on the mechanical properties of epoxy resin", *Journal of the Serbian Chemical Society* **82** (2017) 437–447.<#>
38. Vesna Đorđević, Jasmina Dostanić, Davor Lončarević, S. Phillip Ahrenkiel, Dušan N. Sredojević, Nenad Švrakić, Milivoj Belić, and Jovan M. Nedeljković, "Hybrid visible-light responsive Al₂O₃ particles", *Chemical Physics Letters* **685** (2017) 416–421.<#>
39. J. Papan, K. Vuković, S. P. Ahrenkiel, D. J. Jovanović, and M. D. Dramićanin, "Detailed study of structural and luminescent properties of y₂-xeuxzr₂o₇ (0 ≤ x ≤ 1) nanophosphors", *Journal of Alloys and Compounds* **712** (2017).<#>
40. Sanja Čulubrk, Vesna Lojpur, Scott P. Ahrenkiel, Jovan M. Nedeljković, and Miroslav D. Dramićanin, "Non-contact thermometry with Dy³⁺ doped Gd₂Ti₂O₇ nano-powders", *Journal of Luminescence* **170** (2016) 395–400.<#>
41. Mark W. Wanlass, Scott P. Ahrenkiel, Jeffrey J. Carapella, Daniel J. Friedman, Carl R. Osterwald, and Manuel Romero, "Progress toward an advanced four-subcell inverted metamorphic multi-junction (IMM) solar cell", *Progress in Photovoltaics: Research and Applications* **24** (2016) 139–149.<#>

42. Ivana Vukoje, Tijana Kovač, Jasna Džunuzović, Enis Džunuzović, Davor Lončarević, S. Phillip Ahrenkiel, and Jovan M. Nedeljković, "Photocatalytic ability of visible-light-responsive TiO₂ nanoparticles", *The Journal of Physical Chemistry C* **120** (2016) 18560–18569.<#>
43. M. Vranješ, J. Kuljanin-Jakovljević, Z. Konstantinović, A. Pomar, S. P. Ahrenkiel, T. Radetić, M. Stojiljković, M. Mitrić, and Z. Šaponjić, "Room temperature ferromagnetism in Cu²⁺ doped TiO₂ nanocrystals: The impact of their size, shape and dopant concentration", *Materials Research Bulletin* **76** (2016).<#>
44. B. Milićević, V. Đorđević, D. Lončarević, S. P. Ahrenkiel, M. D. Dramićanin, and J. M. Nedeljković, "Visible light absorption of surface modified TiO₂ powders with bidentate benzene derivatives", *Microporous and Mesoporous Materials* **217** (2015) 184–189.
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