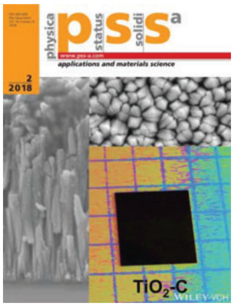

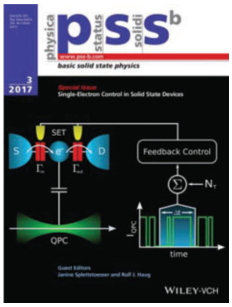

physica status solidi

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Aims and Scope

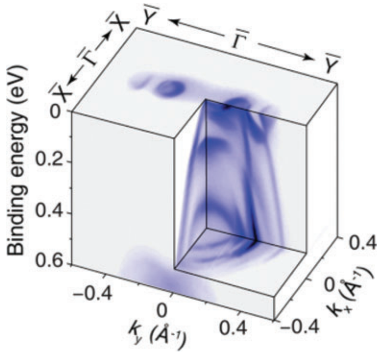
physica status solidi RRL – Rapid Research Letters communicates important findings with a high degree of novelty and need for express publication, as well as other results of immediate interest to the solid state physics and materials science community. Papers from interdisciplinary and emerging new areas of research are particularly welcomed. The flagship pss journal, received a 2016 Impact Factor of **3.032** (up 18 % from 2015).

physica status solidi a – applications and materials science covers modern solid state physics and physical materials science with an emphasis on materials and device applications. This encompasses the preparation, analysis, and description of solid, advanced material systems, nanostructures, films, surfaces, and interfaces with respect to electronic, magnetic, optical, thermal, structural, and morphological properties, as well as device design and characteristics (Impact Factor 1.775).

physica status solidi b – basic solid state physics covers theoretical and experimental investigations of the structural, electronic, optical, magnetic, and thermodynamic properties of solid materials based on quantum solid state physics. Current topics include nanotubes and graphene, 2D layered materials, strongly correlated systems, superconductivity, multiferroics, topological insulators, and semiconductors for device technology (Impact Factor 1.674).

Editorial Advisory Board

In this study, the electronic structure of T_d-WTe_2 is systematically investigated. The measurement and calculation support the prediction of a type-II Weyl semimetal phase in T_d-WTe_2 below 10 K. The authors also realize Lifshitz transitions induced by temperature regulation and surface modification, respectively. The results will shed light on the understanding and manipulation of the electronic structure and physical properties of T_d-WTe_2.

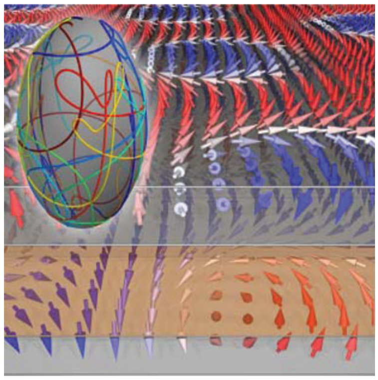


Lifshitz Transitions Induced by Temperature and Surface Doping in Type-II Weyl Semimetal Candidate T_d-WTe_2

Qihang Zhang, Zhongkai Liu, Yan Sun, Haifeng Yang, Juan Jiang, Sung-Kwan Mo, Zahid Hussain, Xiaofeng Qian, Liang Fu, Shuhua Yao, Minghui Lu, Claudia Felser, Binghai Yan, Yulin Chen, and Lexian Yang

Phys. Status Solidi RRL **2017**, *11*, 1700209
DOI 10.1002/pssr.201700209

Buhl et al. theoretically predict a sizeable spin Hall effect which originates in chiral skyrmion textures arising in transition-metal synthetic antiferromagnets. Such "topological" spin Hall effect is extremely sensitive to the electronic structure parameters and can be engineered according to the desired spin current properties. This discovery opens new vistas for the detection and verification of antiferromagnetic skyrmions as well as for generation of sizable spin currents in transition-metal heterostructures.

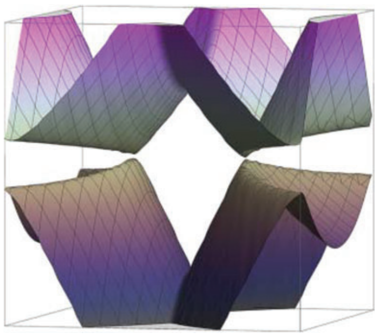


Topological Spin Hall Effect in Antiferromagnetic Skyrmions

Patrick M. Buhl, Frank Freimuth, Stefan Blügel, and Yuriy Mokrousov

Phys. Status Solidi RRL **2017**, *11*, 1700007
DOI 10.1002/pssr.201700007

Topological magnets are excellent candidates for the next era in topological matter and spintronics. In this review, Šmejkal et al. show the new role that antiferromagnets have taken in combining topology with spintronics. The authors illustrate the unique antiferromagnetic symmetries allowing for combining seemingly incompatible effects such as the Néel spin-orbit torques and topological Dirac quasiparticles, or the anomalous Hall effect in noncollinear antiferromagnets.



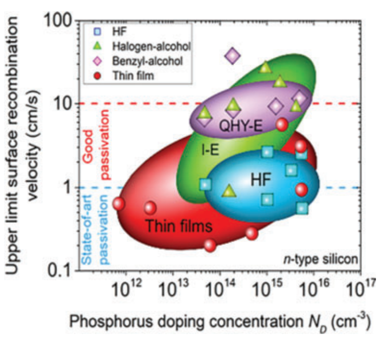
Review@RRL

Route Towards Dirac and Weyl Antiferromagnetic Spintronics

Libor Šmejkal, Tomáš Jungwirth, and Jairo Sinova

Phys. Status Solidi RRL **2017**, *11*, 1700044
DOI 10.1002/pssr.201700044

Temporary surface passivation is widely used for the accurate characterisation of bulk properties of silicon wafers. The authors review the best available temporary passivation schemes for silicon, including liquid immersion based upon acids, halogen-alcohols, benzyl-alcohols, and organic thin film passivation. Practical considerations such as sample pre-cleaning, passivation activation, and stability are discussed, and an outlook for the future of the field is provided.



Review@RRL

Temporary Surface Passivation for Characterisation of Bulk Defects in Silicon: A Review

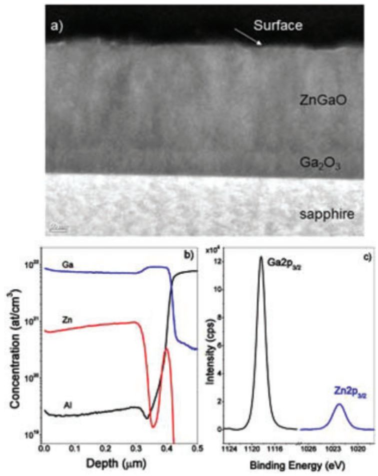
Nicholas E. Grant and John D. Murphy

Phys. Status Solidi RRL **2017**, *11*, 1700243
DOI 10.1002/pssr.201700243

Solar Blind Photodetector Based on Epitaxial Zinc Doped Ga_2O_3 Thin Film

Fikadu Alema, Brian Hertog, Oleg Ledyaev, Dmitry Volovik, Grant Thoma, Ross Miller, Andrei Osinsky, Partha Mukhopadhyay, Sara Bakhshi, Haider Ali, and Winston V. Schoenfeld

Phys. Status Solidi A **2017**, *214*, 1600688
DOI 10.1002/pssa.201600688



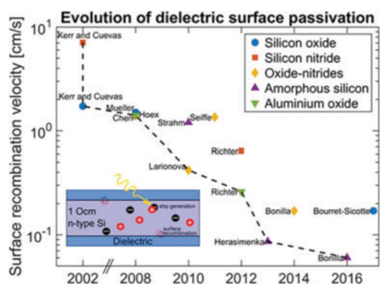
Alema et al. grew doped (Zn) and undoped β-Ga_2O_3 epitaxial films using MOCVD and fabricated the films into MSM photodetectors. The Zn doped β-Ga_2O_3 detectors showed a peak responsivity of 210 A/W with a rejection ratio of 5 × 10^4. The results provide a roadmap towards achieving high responsivity SBPs with strong selectivity in the solar blind spectral window.

Review Article

Dielectric Surface Passivation for Silicon Solar Cells: A Review

Ruy S. Bonilla, Bram Hoex, Phillip Hamer, and Peter R. Wilshaw

Phys. Status Solidi A **2017**, *214*, 1700293
DOI 10.1002/pssa.201700293



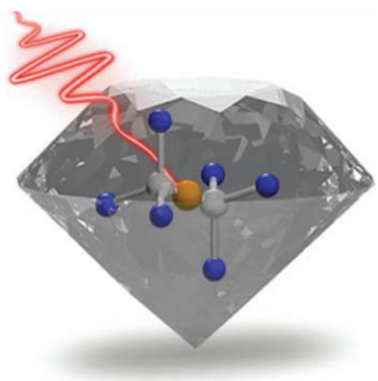
In order to continue to decrease cost and improve performance of silicon solar cells it is essential to minimize electrical losses due to the recombination of electron–hole pairs at cell surfaces. The most common approach is the application of a dielectric coating to suppress these losses, which occur via a combination of different mechanisms. This review article examines the range of dielectric coatings developed in the last two decades and how these coatings act to increase cell performance.

Feature Article

Coherence Properties and Quantum Control of Silicon Vacancy Color Centers in Diamond

Jonas Nils Becker and Christoph Becher

Phys. Status Solidi A **2017**, *214*, 1700586
DOI 10.1002/pssa.201700586



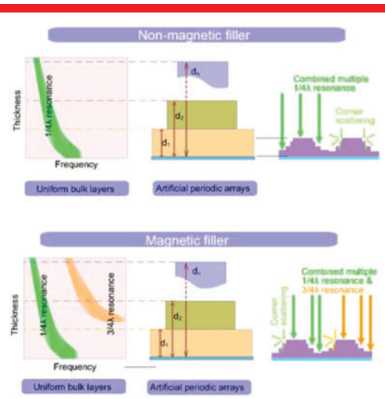
The silicon vacancy color center, an atom-sized defect in diamond, has recently emerged as a promising tool for solid-state-based quantum technologies, due to its favorable optical properties. In this review, the authors summarize the center's electronic and optical properties, as well as recent advances in controlling its quantum state, making it accessible for future quantum information processing applications.

Editor's Choice

Broadening Electromagnetic Absorption Bandwidth: Design from Microscopic Dielectric-Magnetic Coupled Absorbers to Macroscopic Patterns

Pingyuan Liu, Licheng Li, Liming Wang, Ting Huang, Quan-Liang Zhao, Kai-Lun Zhang, Xing-Ming Bian and Zhi-Ling Hou

Phys. Status Solidi A **2017**, *214*, 1700589
DOI 10.1002/pssa.201700589



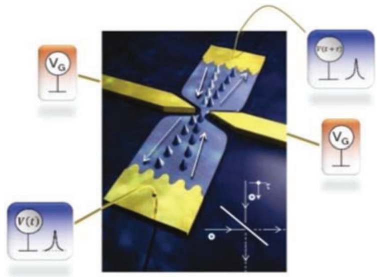
Both nanoscale nonmagnetic and magnetic graphene hybrid fillers have been prepared as the effective absorbers, suggesting that a combination of developing microscopic dielectric-magnetic coupled absorbers and macroscopic structure design would fundamentally extend the effective absorption bandwidth of the electromagnetic absorption materials.

Feature Article
Levitons for Electron Quantum Optics

D. Christian Glattli and Preden S. Roulleau

Phys. Status Solidi B **2017**, *254*, 1600650
DOI 10.1002/pssb.201600650

Electron quantum optics is the recent field of physics where electrons propagating in quantum conductors can be manipulated like photons to perform quantum tasks. In this direction the Levitons, discussed in this Feature Article, are noiseless time-resolved electrons which provide the ideal single electron source for flying qubit realizations.

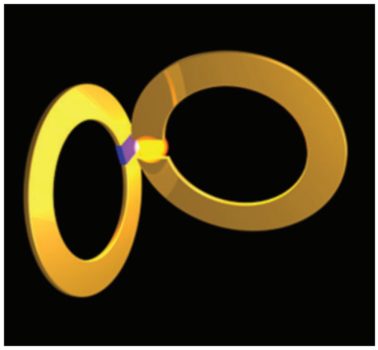


Feature Article
New Degrees of Freedom in Nonlinear Metamaterials

Mikhail Lapine

Phys. Status Solidi B **2017**, *254*, 1600462
DOI 10.1002/pssb.201600462

Introducing new degrees of freedom in metamaterial design is one of the most exciting and fruitful ways to produce nonlinear and tunable metamaterials. This allows for an interplay between electromagnetic, mechanical and thermal phenomena, and results in unusual nonlinear characteristics. This Feature Article provides an overview of the most recent achievements in this area, along with some highlights from the related areas of metamaterial research.

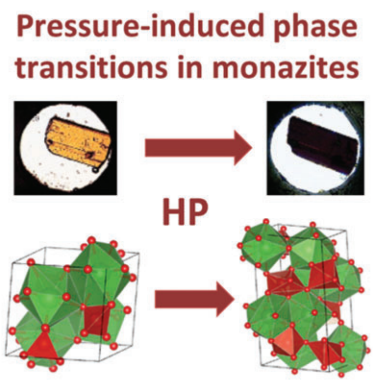


Feature Article
High-Pressure Phase Transitions and Properties of MTO_4 Compounds With the Monazite-Type Structure

Daniel Errandonea

Phys. Status Solidi B **2017**, *254*, 1700016
DOI 10.1002/pssb.201700016

Monazite-type oxides are currently in the focus of research because of their usefulness in a plethora of existing and future technologies. Under high-pressure, these oxides transform to denser phases with new physical properties, which are relevant for novel applications, including green technologies. This Feature Article summarizes recent studies carried out in monazites which have contributed to understand their structural and electronic properties and led to the discovery of phase transitions.



Synthesis of SnO_2 Nanowires Using SnI_2 as Precursor and Their Application as High-Performance Self-Powered Ultraviolet Photodetectors

Jie Jiang, Florian Heck, Detlev M. Hofmann, and Martin Eickhoff

Phys. Status Solidi B **2018**, *255*, 1700426
DOI 10.1002/pssb.201700426

SnO_2 nanowires are synthesized by chemical vapor deposition using elemental tin or SnI2 as tin precursors. The latter is found to be more controllable for the synthesis of SnO_2 nanostructures. X-ray diffraction analysis reveals that the SnO_2 nanowires exhibit rutile crystal structure. Single nanowire photodetectors are processed, which show high responsivities, high external quantum efficiencies, and fast response times at nominal zero bias. The excellent device performance is attributed to the small size and high crystalline quality of the nanowire.