

# **Anatoli Chkrebti, PhD**

**Professor of Physics, and Graduate Program Director, Materials Science, Faculty of Science at University of Ontario Institute of Technology**

Oshawa, ON, CA

World-leading nanomaterials expert collaborates with international researchers to develop high-efficiency, low-cost solar cells

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## **Description**

Reducing global dependence on carbon fuels has never been more crucial to sustaining the planet. Anatoli Chkrebti, PhD, Professor of Physics and Graduate Program Director of Materials Science in the Faculty of Science, is devoted to collaborative, international research to create highly efficient and price-competitive solar cells, as well as improve performance of microelectronic devices.

He is examining cost-efficient nanomaterials to enhance the property and efficiency of solar cells to produce green energy. His research focuses on the simulation of structural, dynamic, electron and optical properties of semiconductor surfaces and interfaces, such as Silicon, in particular Si(100) – the cornerstone of modern electronics, confined systems and nanomaterials toward their device application, including solar cells. Dr. Chkrebti also aims to improve the properties of high-quality materials for microelectronics including functionalized graphene, the thinnest, yet strongest form of carbon. By understanding the nature of these nanomaterials, his research may lead to applications for biotechnology in the healthcare industry, as well as supercapacitors for batteries and microelectronics to increase power across many industries from technology to transportation.

He has spent over three decades pushing the boundaries of novel materials, as a Senior Scientific Researcher with the Institute of Semiconductor Physics of the Academy of Sciences of Ukraine, a Visiting Professor in both the Department of Physics at the University of Rome and the Institute of Solid State Physics at the Technical University of Berlin, Germany. In 1996, he moved to Canada as a post-doctoral fellow of nonlinear quantum optics at the University of Toronto, where he was later named a Research Associate. In 2003, he joined UOIT as an Associate Professor and was appointed Materials Science Graduate Program Director, a program he co-developed. Many theoretical problems have been resolved by his fundamental research with a view towards industrial applications. His authored and co-authored works have appeared in more than 120 highly ranked publications and four monograph chapters as A.I. Shkrebti.

He received his Doctorate from the Institute of Semiconductor Physics, and his Master of Science in Theoretical Physics (Honours) and Diploma in Theoretical Solid State Physics from the Department of Physics at Kiev State University, both in the former USSR.

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## **Industry Expertise**

Cleantech, Education/Learning, Nanotechnology, Program Development, Renewables and Environmental, Research, Semiconductors

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## **Topics**

Solid State Physics Computational Physics, Semiconductors Their Surfaces and Nanomaterials, Linear and Nonlinear Optical Phenomena , Electronic Structural and Dynamical Properties of Novel Materials

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## **Affiliations**

American Physical Society, Canadian Association of Physicists , Institute of Electrical and Electronics Engineers , Materials Research Society

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## **Past Talks**

**Poster Presentation: Betavoltaics: Analysis of the Attainable Efficiency for Direct-Bandgap Semiconductors**

32nd European Photovoltaic Solar Energy Conference and Exhibition

**Poster Presentation: Correlation of Temperature Dependent Vibrations, Structure and Optical Response of Si(100) Surface from First Principles**

15th International Conference on Vibrations at Surfaces

**Poster Presentation: Characterization of Hydrogen in  $\delta$ -Si and  $\epsilon$ -Si:H from ab-Initio Molecular Dynamics: Structure, Optics and Vibrations**

The 29th European Photovoltaic Solar Energy Conference

**Poster Presentation: Modelling Photoconversion Efficiency of Tandem Solar Cells: Interface vs. Bulk Contributions**

The 14th International Conference on the Formation of Semiconductor Interface

**Poster Presentation: Anomalous Stokes Shift in CdTe Nanocrystals: Theory vs . Experiment**

XI International Conference on Nanostructured Materials

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## **Education**

**Institute of Semiconductor Physics**

PhD Semiconductors

**Kiev State University**

MSc Theoretical Physics

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## **Accomplishments**

**Author and Co-author**

Dr. Chkrebti has authored and co-authored more than 120 highly ranked publications and four product monographs. His work is published as A.I. Shkrebti.

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