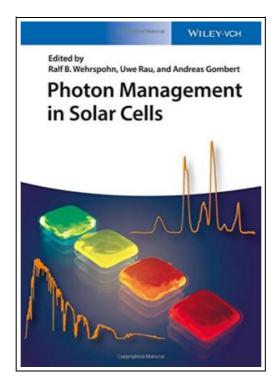
Photon Management in Solar Cells



Filesize: 6.52 MB

Reviews

Basically no phrases to explain. It really is filled with knowledge and wisdom You are going to like how the author create this book. (Gerald Conn)

PHOTON MANAGEMENT IN SOLAR CELLS



Condition: New. Publisher/Verlag: Wiley-VCH | Written by renowned experts in the field of photon management in solar cells, this one-stop reference gives an introduction to the physics of light management in solar cells, and discusses the different concepts and methods of applying photon management. The authors cover the physics, principles, concepts, technologies, and methods used, explaining how to increase the efficiency of solar cells by splitting or modifying the solar spectrum before they absorb the sunlight. In so doing, they present novel concepts and materials allowing for the cheaper, more flexible manufacture of solar cells and systems. For educational purposes, the authors have split the reasons for photon management into spatial and spectral light management. Bridging the gap between the photonics and the photovoltaics communities, this is an invaluable reference for materials scientists, physicists in industry, experimental physicists, lecturers in physics, Ph.D. students in physics and material sciences, engineers in power technology, applied and surface physicists. | PrefaceCURRENT CONCEPTS FOR OPTICAL PATH ENHANCEMENT IN SOLAR CELLSIntroductionPlanar Antireflection CoatingsOptical Path Enhancement in the Ray Optical LimitScattering Structures for Optical Path EnhancementResonant Structures for Optical Path EnhancementUltra-Light TrappingEnergy-Selective Structures as Intermediate Reflectors for Optical Path Enhancement in Tandem Solar CellsComparison of the ConceptsConclusionsTHE PRINCIPLE OF DETAILED BALANCE AND THE OPTO-ELECTRONIC PROPERTIES OF SOLAR CELLSIntroductionOpto-Electronic ReciprocityConnection to Other Reciprocity TheoremsApplications of the Opto-Electronic Reciprocity TheoremLimitations to the Opto-Electronic Reciprocity TheoremConclusionsREAR SIDE DIFFRACTIVE GRATINGS FOR SILICON WAFER SOLAR CELLSIntroductionPrinciple of Light Trapping with GratingsFundamental Limits of Light Trapping with GratingsSimulation of Gratings in Solar CellsRealizationTopographical CharacterizationSummaryRANDOMLY TEXTURED SURFACESIntroductionMethodologyProperties of an Isolated InterfaceSingle-Junction Solar CellIntermediate Layer in Tandem Solar CellsConclusionsBLACK SILICON PHOTOVOLTAICSIntroductionOptical Properties and Light Trapping PossibilitiesSurface Passivation of Black SiliconBlack Silicon Solar CellsCONCENTRATOR OPTICS FOR PHOTOVOLTAIC SYSTEMSFundamentals of Solar ConcentrationOptical DesignsSilicone on Glass Fresnel LensesConsiderations on Concentrators in HCPV SystemsConclusionsLIGHT-TRAPPING IN SOLAR CELLS BY DIRECTIONALLY SELECTIVE FILTERSIntroductionTheoryFilter...



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