

Table of Contents

Preface

Fundamentals

Mathematics and Innovation in Engineering

E. Beretta, A. Gandolfi and C.C.A. Sastri

3

Invention and Innovation: A Case Study in Metals

M.C. Connelly and J.A. Sekhar

15

Energy and Materials

Wind Energy Electrical Power Generation Industry Life Cycle - Impact of Modern Materials Systems on Economic Viability

J.P. Dismukes, L.K. Miller, A. Solocha and J.A. Bers

43

Material Innovations in Alternative Energy - Collaboration, Systems and Opportunities

D.W. Swenson

67

Electronic Materials

Disruptive Inventions in Electroceramics

E.C. Subbarao

81

Transparent Thin Film Transistors Based on InZnO for Flexible Electronics

S.J. Pearton, W.T. Lim, Y.L. Wang, K. Shoo, D.P. Norton, J.W. Lee, F. Ren and J.M. Zavada

99

Jet Engine Materials

Superalloy Technology - A Perspective on Critical Innovations for Turbine Engines

R. Schafrik and R. Sprague

113

By Leaps and Bounds: The Realization of Jet Propulsion through Innovative Materials and Design

G.A. Danko

135

Ophthalmologic Materials

The Property Driven Innovation of Materials for Use in Ophthalmology

L.L. Chapoy and J.M. Lally

149

Glass

Fluorine Doped Tin Oxide Coatings - Over 50 Years and Going Strong

P. Gerhardinger and D. Strickler

169

Wood

Innovations in Wood Science

A.S. Sekhar

181

Commercial Nano-Fibers

Development and Commercialization of Vapor Grown Carbon Nanofibers: A Review A. Nadarajah, J.G. Lawrence and T.W. Hughes	193
--	-----

Aluminum

Innovation with Low-Ionization Plasma Sources for Enhanced Aluminum Processing G.S. Reddy, M. Jog and J.A. Sekhar	209
---	-----

Iron

Redemption of Microscale Mill Waste into Commercial Nanoscale Asset A.M. Azad, S. Kesavan and S. Al-Batty	229
---	-----