

Table of Contents

Preface

The ESPRIT Advanced Research Initiative in Optoelectronics MEL-ARI OPTO P. Malinverni	1
Silicon Emitting Device Will Knock Down Communication Bottleneck? M. Balucani, S. La Monica, S. Lazarouk, G. Maiello, G. Masini and A. Ferrari	8
AFM and STM Investigations of Electroluminescent SiO₂/Si Superlattices Prepared by Chemical Vapour Deposition L. Heikkilä, T. Kuusela, H.-. Hedman, A. Pavlov and H. Ihanntola	13
Characterization of Porous Silicon Light Emitting Diodes in High Current Density Conditions S. La Monica, M. Balucani, S. Lazarouk, G. Maiello, G. Masini, P. Jaguiro and A. Ferrari	21
On the Route towards Efficient Light Emitting Diodes Based on Porous Silicon M. Cazzanelli, L. Pavesi, O. Bisi, P. Dubos, P. Bellutti, G. Soncini, G. Faglia and G. Sberveglieri	27
Light Emission Characterization of Al-Porous Silicon Schottky Junction S. La Monica, M. Balucani, G. Castaldo, S. Lazarouk, G. Maiello, G. Masini and A. Ferrari	37
Amorphous Silicon Photodetectors for Silicon Based Optical Waveguides G. Maiello, M. Balucani, V. Bondarenko, G. De Cesare, S. La Monica, G. Masini and A. Ferrari	45
Porous Silicon Bragg Reflectors for Colour Sensing Applications G. Amato, L. Boarino, N. Brunetto, A.M. Rossi, R. Steni, A. Bellone, L. Schirone and G. Sotgiu	50
Ge/Si (001) Photodetector for Near Infrared Light L. Colace, G. Masini, F. Galluzzi, G. Assanto, G. Capellini, L. Di Gaspare and F. Evangelisti	55
Optical and Morphological Properties of Stain-Etched Porous Silicon Films for Anti-Reflection Coatings of Photovoltaic Devices L. Schirone, G. Sotgiu, A. Parisini and M. Montecchi	59
The Colourful World of Porous Silicon: From Interference Filters to Applications M. Thönissen, M.G. Berger, W. Theiss, S. Hilbrich, M. Krüger and H. Lüth	65
Humidity Sensor Based on Partially Oxidized Porous Silicon M. Balucani, V. Bondarenko, L. Dolgyi, S. La Monica, G. Maiello, G. Masini, V. Yakovtseva and A. Ferrari	75
Influence of the Host Composition on the Equilibrium Structure of Er-Centers in Silicon S. Pizzini, M. Donghi, S. Binetti, I. Gelmi, A. Cavallini, B. Fraboni and G. Wagner	86
Visible and IR Photoluminescence of Erbium Doped Porous Silicon Films V.V. Filippov, P.P. Pershukovich, V.S. Homenko, M. Balucani, V. Bondarenko, S. La Monica, G. Maiello, G. Masini and A. Ferrari	94
Structural and Thermal Properties of High Porosity Freeze-Dried Porous Silicon G. Amato, G. Benedetto, L. Boarino, N. Brunetto, R. Špagnolo, R. Angelucci and A. Parisini	101
Thin Films of Granular Silicon: Electrical, Structural and Optical Characterization C. Ciofi, A. Diligenti, A. Nannini, G. Pennelli, N. Vannucci, F. Fuso and M. Allegrini	109
Time-Resolved Spectroscopy and Photoassisted STM Investigations of Laser Deposited Porous Silicon A. Pavlov, Y. Pavlova, R. Laiho, R. Herino, I. Mihalcescu and R. Romestain	119
The Optical Transition in a Si Wire Passivated by H and O-H S. Ossicini and O. Bisi	127