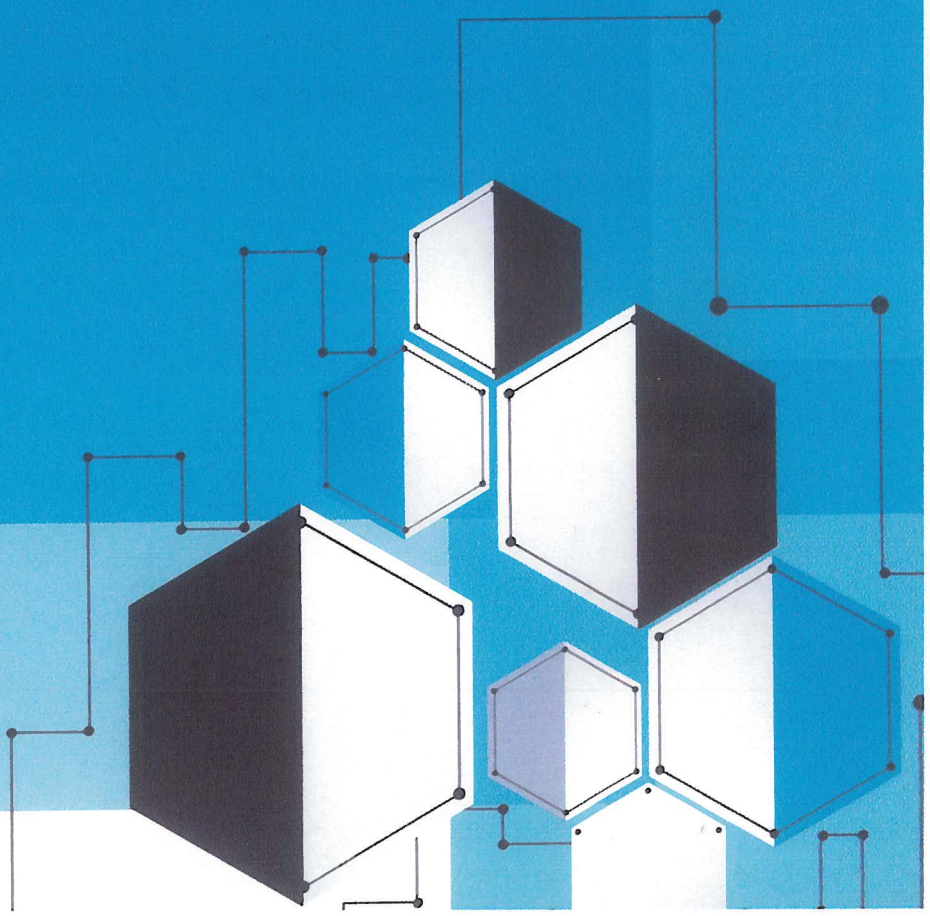
mne2017

BRAGA - PORTUGAL | SEP. 18-22

CONFERENCE BOOKLET

43rd INTERNATIONAL CONFERENCE ON MICRO AND NANOENGINEERING



12:15 **OC035**

InGaAS/GaAs multi-quantum-well core-shell nanowires for optoelectronic applications

Suzanne Lancaster [1]; Donald Macfarland [1]; Mattia Capriotti [1]; Aaron Maxwell Andrews [1]; Werner Schrenk [1]; Gottfried Strasser [1]; Hermann Detz [2]

[1] - TU Wien;
[2] - Austrian Academy of Sciences

We present core-multishell GaAs/InGaAs nanowires grown via solid source molecular beam epitaxy. Nanowires with 1, 3 and 5 InGaAs quantum wells (QWs) in the shell are analysed via microphotoluminescence and the emission from a single nanowire is improved by up to 10x in the 5-QW samples. This large increase is attributed to the reduction of nanowire tapering by careful control of the growth parameters, and a shielding of the inner QWs from the surface potential in multi-QW nanowires leads to a narrower linewidth. These results indicate that as well as optimising the growth, the role of the NW surface needs to be considered, and band engineering in CMS structures should find ways to compensate for surface states and resulting band-bending.

12:30 **Session 4B** ROOM C

Session chair: Lei Chen (NIST, Clarksburg)
Session Co-Chair: Rubem Sommer (CBPF, Rio de Janeiro)

Topic 4 - Micro/Nano Engineering for the Life Sciences
Sub-topics 4.3 – Micro and Nano Fluidic Systems and their Fabrication; 4.4 – Applications of Micro and Nano Engineeried Fluidic Systems for Life Sciences

11:00 **Invited Lecture**

INV07

Micro / nano systems for biofilm exploration and eradication

Ryan Huiszoon [2,3]; Sowmya Subramanian [1,2]; Pradeep Rajasekaran [2], William Bentley [3], Reza Ghodssi [1,2]

[1] - Department of Electrical and Computer Engineering, University of Maryland, USA
[2] - Institute for Systems Research, University of Maryland, USA
[3] - Fischell Department of Bioengineering, University of Maryland, USA

Biofilms account for more than 70% of hospital acquired infections (HAIs) and impart increased antibiotic resistance to biofilm-encapsulated-bacteria, adhered to wet surfaces. We have developed numerous micro/nano systems for exploring biofilm growth in real-time in tightly controlled and reproducible manner. Operating in parallel and leveraging small volumes, these microfluidic platforms can aid us in understanding the fundamental mechanisms of biofilm formation and for the discovery of novel therapeutics. Furthermore, we have also developed integrated feedback based microelectronic sensor-treatment systems towards in vivo applications in medical implant, such as a catheter. Thus, the micro/nano systems discussed here are aimed towards the development of autonomous microsystems capable of identifying and treating biofilms in a translational setting, to address challenges like post-operative infections.