

## COST MP0805 FINAL MEETING

### PROGRAM

Invited talks (bold): 30 min (inc. questions)

Contributed talks: 20 min (inc. questions), speaker underlined

#### 24 SEPTEMBER 2013 TUESDAY

09:00 - 10:15 Registration

10:15 - 10:30 Welcome remarks

#### SESSION I -DILUTE NITRIDES I

10:30-12:20

CHAIR: N. BALKAN

10:30 - 11:00 *Low-Dimensional Dilute Nitride InGaAsN/GaAs Heterostructures*  
**E. Kapon**, R. Carron, A. Surrente, P. Gallo, B. Dwir and A. Rudra

11:00 - 11:20 *Strain engineering of dilute nitrides via spatially selective hydrogenation*  
**M. Felici**, S. Birindelli, R. Trotta, A. Notargiacomo, A. Gerardino, S. Rubini, F. Martelli, A. Polimeni, M. Capizzi

11:20- 11:40 *Single photon emission from site-controlled Ga(AsN) quantum dots*  
**S. Birindelli**, M. Felici, R. Trotta, J. Wildmann, A. Gerardino, S. Rubini, F. Martelli, A. Polimeni, M. Capizzi

11:40- 12:00 *Carrier dynamics in dilute nitrides: Experimental study versus Monte-Carlo simulations*  
**R. Kudrawiec**, M. Baranowski, M. Latkowska, M. Syperek, and J. Misiewicz

12:00-12:20 *Self-Consistent Green's Function Method for Band Structure, Scattering and Carrier Mobility in Dilute Nitride Alloys*  
**M. Seifika**, S. Fahy, E. P. O'Reilly

12:20- 14:30 LUNCH BREAK

#### SESSION II -DILUTE NITRIDES II

14:30-16:40

CHAIR: C. FONTAINE

14:30 - 15:00 *Frequency-converted dilute nitride laser diodes for mobile display applications*  
**J. Kontinen**

15:00 - 15:20 *Room temperature luminescence beyond 1.3  $\mu\text{m}$  from GaAsSbN-capped InAs quantum dots*  
**A.D. Utrilla**, J. M. Ulloa, L. Domínguez, D. F. Reyes, D. González, A.

- Guzman and A. Hierro
- 15:20 - 15:40** *Hydrogen irradiation of In(AsN)*  
S. Birindelli, L. Qi, M. Kesaria, Q.D. Zhuang, A. Krier, A. Patanè, A. Polimeni, **M. Capizzi**
- 15:40 - 16:00** *Ga<sub>0.35</sub>In<sub>0.65</sub>N<sub>0.02</sub>As<sub>0.08</sub> /GaAs Bi-directional Light Emitting and Absorbing Heterojunction operating at 1.3 μm*  
**F. A. I. Chagmaqchee** and Naci Balkan
- 16:00 – 16:20** *GaInNAsSb Solar Cells Grown by MBE*  
**A. Aho** , A. Tukiainen, V. Polojärvi, W. Zhang, J. Salmi and M. Guina
- 16:20 – 16:40** *Strain-engineered InAs/Ga(In)NAs/GaAs quantum dot solar cells*  
**E. Pavelescu**, V. Polojärvi, A. Aho, A. Tukiainen, A. Schramm, W. Zhang, Joel Salmi, M. Guina
- 16:40 – 17:00** **BREAK**

### **SESSION III - InGaN & GaN**

**17:00-18:00**

**CHAIR: E. TIRAŞ**

- 17:00 – 17:20** *Molecular Beam Epitaxy of Single Phase InGaN Films in the Entire Alloy Composition Range for Photovoltaic Applications*  
E. Papadomanolaki, M. Androulidaki, K. Tsagaraki, C. Bazioti, Th. Kehagias, G. Dimitrakopoulos and **E. Iliopoulos**
- 17:20 – 17:40** *InGaN MQW photoluminescence enhancement by localized surface plasmons in isolated Ag nanoparticles*  
**G. Tamulaitis** , D. Dobrovolskas, J. Mickevicius, C.-W. Huang, C.-Y. Chen, C.-H. Liao, C. Hsieh, Y.-L. Jung, and C.C. Yang
- 17:40 – 18:00** *Chemical Synthesis and Characterization of GaN Quantum Dots Incorporated in Simple Photonic Devices*  
**M. Vasileiadis** , I. Koutselas, D. Alexandropoulos, N. Kehagias, K. Dimos, M. Karakassides, L'uboš Jankovic, R. Zboril, Peter Komadel, and N. Vainos

### **POSTER PRESENTATION**

**18:00-20:00**

*Beverages and Snacks will be served during the session*

## 25 SEPTEMBER 2013 WEDNESDAY

### SESSION IV - III-V on Silicon & Bismide alloys

09:00-10:20

CHAIR: M. HOPKINSON

- 09:00 - 09:30 *3D heteroepitaxy of Ge and GaAs on patterned Si substrates: a new monolithic integration strategy*  
**S. Sanguinetti**, R. Bergamaschini, S. Bietti, F. Isa, G. Isella, A. Marzegalli, F. Montalenti, F. Pezzoli, A. Scaccabarozzi, C. V. Falub, H. von Känel and L. Miglio
- 09:30 - 09:50 *Bi-assisted nucleation of GaAs grown on silicon by molecular beam epitaxy*  
P. Boonpeng, H. Makhloufi, G. Lacoste, A. Arnoult, **C. Fontaine**
- 09:50 - 10:20 *Valence band structure of dilute bismide alloys for optoelectronic device applications*  
**Eoin P. O'Reilly**, C. Broderick, P. Harnedy, M. Usman
- 10:20 - 11:00 BREAK

### SESSION V- BISMIDE ALLOYS II

11:00-12:30

CHAIR: Ç. ARIKAN

- 11:00- 11:30 *Optical and spin properties of GaAsBi epilayers*  
S. Mazzucato, H. Lehec, **H. Carrere**, T. T. Zhang, D. Lagarde, P. Boonpeng, A. Arnoult, G. Lacoste, A. Balocchi, T. Amand, C. Fontaine, and X. Marie
- 11:30 - 11:50 *Morphological instabilities in GaAs<sub>1-x</sub>Bi<sub>x</sub> layers grown by molecular beam epitaxy*  
**E. Luna**, M. Wu, J. Puustinen and M. Guina
- 11:50 - 12:10 *Formation and phase transformation of Bi-containing clusters in annealed GaAs<sub>1-x</sub>Bi<sub>x</sub> epilayers*  
**M. Wu**, E. Luna, J. Puustinen, M. Guina and A. Trampert
- 12:10 - 12:30 *Analysis of bismuth distribution in GaAsBi/GaAs layers: segregation and CuPtB atomic ordering*  
**D.F. Reyes**, F. Bastiman, A.R. Mohmad, D.L. Sales, R. Beanland, A.M. Sanchez, J.P.R David, D. González
- 12:30 - 14:30 LUNCH BREAK

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## SESSION VI -BISMIDE ALLOYS III

14:30-16:20

CHAIR: A. POLIMENI

- 14:30 -14:50** *Optical characterization of bulk GaAs<sub>1-x</sub>Bi<sub>x</sub> and GaAs/GaAs<sub>1-x</sub>Bi<sub>x</sub> quantum well structures*  
**O. Donmez**, K. Kara, F.Sarcan, E. Akalin, A. Erol, M. C. Arikan, C. Fontaine
- 14:50 - 15:10** *Structural and optical properties of GaAs<sub>1-x</sub>Bi<sub>x</sub> quantum wells grown by molecular beam epitaxy – Effect of rapid thermal annealing*  
**H.Makhloufi**, P. Boonpeng, S. Mazzucato, H. Carrère, J. Nicolai, G. Lacoste, A. Arnoult, X. Marie, A. Ponchet and C. Fontaine
- 15:10 - 15:30** *Effect of hydrogen on the electronic properties of Ga(AsBi) alloys*  
**G. Pettinari**, A. Patanè, A. Polimeni, M. Capizzi, Xianfeng Lu, T. Tiedje
- 15:30 - 15:50** *Structural and optical characterizations of InPBi thin films grown by molecular beam epitaxy*  
Y. Gu, K. Wang, H. F. Zhou, Y. Y. Li, C. F. Cao, L. Y. Zhang, Y. G. Zhang, Q. Gong, **S.M. Wang**
- 15:50 - 16:20** *MOVPE growth of Ga(AsBi)/(AlGa)As heterostructures and laser diodes*  
**P. Ludewig**, N. Knaub, Z. Bushell, L. Nattermann, S. Chatterjee, W. Stolz, and K. Volz
- 16:30 - 18:15** **FREE TIME (Excursion: Beyazit Tower and Botanical Garden are available to visit for participants)**
- 19:30 - 23:00** **DINNER & BOSPHORUS BOAT TOUR**
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## 26 SEPTEMBER 2013 THURSDAY

### MP0805 ACTION FINAL ASSESMENT 08:30-12:30

**08:30-09:00** 1. *COST Presentation*

**M. Moragues**

**09:00 – 09:15** 2. *Overview of Action's MoU and the main results*

**M. Guina**

- Summary of training events
- Summary of STSMs and Publications
- Gender Issues

**09:15-10:15** *Presentations of WG Leaders – Results of the actions*

**M. Hopkinson (WG1), R. Kudrawiec (WG2),**

**D. Alexandropoulos (WG3), X. Marie (WG4)**

*(10 minutes overview + 5 minutes questions for each WG)*

**10:15-10:30** 4. *Other Presentations:*

**M. Guina:** *MP0805 results – path to commercialization success stories*

**10:30 - 11:00** BREAK

**11:00 -12:30** *Discussion between evaluation panel (DC Rapporteur, External Expert 1, External Expert 2 and So) and the Chair of the Action and Grant Holder Scientific Representative)*

*Attended by the MC members, the external Evaluators and the COST Office representatives. Financial report from the COST Office, comments and questions from the DC Rapporteur and the external Evaluators, general discussion, future plans including final reporting requirements and deadlines.*

**12:30** *End of the meeting*

## POSTER PRESENTATIONS

- P1** *Effect of Gamma Irradiation on deep levels detected by DLTS in GaAs<sub>x</sub>N<sub>1-x</sub> with different Nitrogen concentration*  
**N. Al Saqri** , M. Aziz , J. F. Felix, D. L. da Cunha , R. H. Mari , D. Jameel , W. M. de Azevedo, E.F. da Silva jr, D. Taylor , M. Henini
- P2** *Trapping and escape time in p-i-n GaInNAs/GaAs multiple quantum wells structures*  
**Hagir M. Khalil**, Simone Mazzucato, Naci Balkan
- P3** *Effect of Post Growth Thermal Annealing on Deep Level Defects in MBE Grown Dilute Nitride Ga<sub>1-x</sub>In<sub>x</sub>NyAs<sub>1-y</sub> p-i-n Structures*  
**D.A. Jameel**, M. Aziz, R. H. Mar, J. Francisco Felix, N. Al saqri, S. Tan, D. Taylor, M. Henini
- P4** *Optical and Magneto-Optical Properties of GaAsBi Layers Grown by Molecular Beam Epitaxy*  
H.V.A. Galeti, Y. Galvão Gobato, V. Orsi Gordo, M.P.F. de Godoy, R. Kudraviec, O.M. Lemine, A.Alkaoud, **M. Henini**
- P5** *Spin Effects in InGaAsN/GaAs Quantum Wells Grown by Molecular Beam Epitaxy*  
H.V.A. Galeti, Y. Galvão Gobato, M.P.F. de Godoy, V. Orsi Gordo, L. Kiyoshi Sato de Herval, A. Khatab, **M. Henini**, O.M. Lemine, M. Sadeghi, S. Wang
- P6** *Determination of the electron effective mass in AlInN/AlN/GaN heterostructures by using the quantum Hall effect measurements*  
**E. Tiras** , S. Ardali , E. Arslan , E. Ozbay
- P7** *Impact of the temperature on the performances of GaInNAs-based PBG waveguide modulators*  
**G. Calò**, D. Alexandropoulos, V. Petruzzelli
- P8** *Experimental investigation and numerical modelling of photocurrent oscillations in GaInNAs/GaAs p-i-n photodiodes*  
B. Royall, **S. Mazzucato**, H. Khalil, A. Erol, Y. Ergun, M. Hugues, M. Guina, N. Balkan
- P9** *Spectral Photoconductivity Studies on GaAs<sub>1-x</sub>Bi<sub>x</sub> Epilayers*  
**M. Aslan**, V. Bahrami, T. Tiedje
- P10** *Thermal annealing- and Nitrogen-induced effects on electronic transport in n-and p-type modulation doped GaInNAs/GaAs quantum well structures*  
O. Donmez, F. Sarcan, A. Erol, M. Gunes, **M. C. Arıkan**, J. Puusitinen, M. Guina
- P11** *Optical properties of GaBiAs ternary alloys*  
**F. Sarcan**, A. Erol, M. C. Arıkan, C. Fontaine
- P12** *GaAsPN alloys for optoelectronics on Silicon*  
H. Carrere, A. Balocchi, **D. Lagarde**, T. Amand and X. Marie
- P13** *High Field Hot Electron Energy Relaxation in InGaN/GaN Samples*  
**S. Mutlu** , S. Ardali , E. Tiras , N. Balkan

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- P14** *Identification of four-hydrogen complexes in In-rich InGaN alloys using Photoluminescence, x-ray absorption, and density functional theory*  
**M. De Luca**, G. Pettinari, G. Ciatto, L. Amidani, F. Filippone, A. Polimeni, F. Boscherini, A. Amore Bonapasta, M. Capizzi
- P15** *Hot Electron Energy Relaxation in Al<sub>0.83</sub>In<sub>0.17</sub>N/AlN/GaN heterostructure*  
**S. Ardali**, S. Mutlu, E. Tiras, E. Arslan, E. Ozbay
- P16** *Photoreflectance and photoluminescence studies of GaAsBi layers and quantum wells*  
**J. Kopaczek**, R. Kudrawiec, J. Misiewicz, F. Bastiman
- P17** *Gain in electrically-driven 1.3  $\mu$ m dilute nitride VCSOAs*  
**S. B. Lisesivdin**, N. A. Khan, S. Mazzucato, N. Balkan, M. J. Adams
- P18** *GaNAsSb/GaAs semiconductor optical amplifiers and laser diodes*  
**V.M. Korpijärvi**, D. Fitsios, G. Giannoulis, J. Viheriälä, J. Mäkelä, A. Laakso, N. Iliadis, M. Spyropoulou, G.T. Kanellos, N. Pleros, M. Guina
- P19** *Time-resolved photoluminescence study on GaNAsSb solar cells*  
**A. Gubanov**, V. Polojärvi, A. Aho, A. Tukiainen, W. Zhang, A. Schramm, M. Guina
- P20** *Morphology and electronic properties of site-controlled InAs quantum dots*  
**T.V. Hakkarainen**, E. Luna, A. Schramm, J. Tommila, M. Guina
- P21** *Performance Prediction of Quantum Dots Based Highly Resonant Optical Amplifiers*  
**M. Vasileiadis**, D. Alexandropoulos, C.(T) Politi, N. Vaino
- P22** *A study on negative differential resistance in n- and p-type GaInNAs/GaAs QWs*  
**L.B. Buklu**, F. Sarcan, A. Erol, M.C. Arıkan, J. Puustinen, M. Guina
- P23** *Photoluminescence Redshift Relative to Photoabsorption in III-V-Nitride Structures*  
**R. Brazis**
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