

## 10<sup>th</sup> scientific day of the thematic doctoral school METAMORPHOSE

**Tuesday 21 May 2024**

University of Mons

*Auditoire 023, Centre Vésale, Campus de la Plaine de Nimy  
avenue du champ de mars, 7000 Mons*

**9h00** WELCOME

9h40 Introduction

**Chair:** [Xavier URBAIN \(Université Catholique de Louvain\)](#)

9h45 **Ruben DE GROOTE** (Nuclear and Radiation Physics, KULeuven) **(invited speaker):**  
*Laser spectroscopy of radioactive atoms: shedding light on the atomic nucleus.*

10h30 **Marie-Thérèse EL KATTAR** (Université du Littoral Côte d'Opale, Dunkerque):  
*Ground-based measurements from a near-infrared laser heterodyne radiometer (LHR) for CO<sub>2</sub> measurements.*

10h50 COFFEE BREAK and POSTERS

**Chair:** [Bastien VISPOEL \(Université de Namur\)](#)

11h30 **Jean CLEMENT** (Université de Namur): *Collisional broadening coefficients of lines in the  $\nu_4$  band of methane broadened by CO<sub>2</sub> and N<sub>2</sub> using a mid-infrared dual-comb spectrometer.*

11h50 **Carla SILVA TAFUR** (Université Libre de Bruxelles): *High resolution study of the  $\nu_{22}$  band of pyrrole (C<sub>4</sub>H<sub>5</sub>N) near 14  $\mu$ m.*

12h10 **Minh Nhut NGO** (Université du Littoral Côte d'Opale, Dunkerque): *Laser absorption spectroscopy with non-resonance cavities for gas sensing applications, towards laboratory detection of HO<sub>2</sub> radicals.*

12h30 LUNCH (sandwich buffet) and POSTERS

Chair: [Jean VANDER AUWERA \(Université Libre de Bruxelles\)](#)

13h45 **Weidong CHEN** (Laboratoire de PhysicoChimie de l'Atmosphère, Université du Littoral Côte d'Opale, Dunkerque) (**invited speaker**): *Photonic techniques for atmospheric quantitative spectroscopy: Sensing atmosphere in simulation chamber and in the real world.*

14h30 **Médéric LOYEZ** (Université de Mons): *Benchmarking insulin biosensing using plasmonic optical fiber chips.*

14h50 **Tingting WEI** (Université du Littoral Côte d'Opale, Dunkerque): *Transportable all-fiber coupled laser heterodyne radiometer for ground-based remote sensing of greenhouse gases in the atmospheric column.*

15h10 COFFEE BREAK and POSTERS

Chair: [Clément LAUZIN \(Université Catholique de Louvain\)](#)

15h45 **Mithun PAL** (Institute of Experimental Physics, Graz University of Technology, Austria) (**invited speaker**): *Towards VUV dual comb spectroscopy: Challenges and opportunities.*

16h30 **Sèvi Komlanvi KAKA** (Université de Namur): *On the third-order nonlinear optical responses of cis and trans stilbene – A quantum chemistry investigation.*

16h50 FINAL REMARKS

16h55 END OF MEETING

## POSTERS

A. Aerts,<sup>1</sup> N. Vaeck,<sup>1</sup> *Overcoming the Curse of Dimensionality in Potential Energy Surfaces with Sparse Grids and Local Polynomial Interpolation.*

A.S. Bogomolov,<sup>2</sup> R. Glorieux,<sup>2</sup> T. Corbo,<sup>2</sup> M. Herman,<sup>1</sup> C. Lauzin,<sup>2</sup> *Improvements of the FANTASIO experimental setup.*

H. Carvajal Gallego,<sup>3</sup> J. Deprince,<sup>3</sup> J-C. Pain,<sup>3</sup> P. Palmeri,<sup>3</sup> P. Quinet,<sup>3</sup> *Statistical and theoretical atomic data calculations in moderately-charged lanthanide ions for opacity computation purposes in the context of early-phase kilonovae.*

S. Collignon,<sup>2</sup> B.M. Hays,<sup>4</sup> M. Daman,<sup>2</sup> D. Lederer,<sup>2</sup> C. Lauzin,<sup>2</sup> *Development and applications of a chirp-pulse Fourier transform microwave spectrometer in the 6 to 18 GHz frequency range.*

N. Dricot,<sup>5</sup> B. Vispoel,<sup>5</sup> M. Lepère,<sup>5</sup> *Collisional effects of acetylene infrared absorption lines by high-resolution spectroscopies.*

E. Ducreux,<sup>6,7,5</sup> B. Grouiez,<sup>6</sup> S. Robert,<sup>7</sup> M. Lepère,<sup>5</sup> B. Vispoel,<sup>5</sup> R.R. Gamache,<sup>8</sup> L. Régalia,<sup>6</sup> *Beyond the Voigt line profile for H<sub>2</sub>O-CO<sub>2</sub> collision system.*

H. Fasseaux,<sup>3</sup> M. Loyez,<sup>3</sup> C. Caucheteur,<sup>3</sup> *Unveiling Surface Refractive Index Changes in Plasmonic Optical Fiber Biosensors with Comp-Like Spectra.*

M. Groyne,<sup>9,5</sup> B. Champagne,<sup>5</sup> M. De Becker,<sup>9</sup> *Astrochemistry – A game of spatial and temporal scales.*

X. Urbain,<sup>2</sup> M. Génévriez,<sup>2</sup> X. Huet,<sup>1</sup> *Theoretical and experimental study of rotationally-resolved spectrum of CO<sup>++</sup>.*

L. Maison,<sup>3</sup> P. Palmeri,<sup>3</sup> P. Quinet,<sup>3</sup> *Computations of radiative decay rates for forbidden lines in doubly ionized lanthanides for kilonovae nebular phase studies.*

R. Marion,<sup>10</sup> B. Bertrand,<sup>10</sup> E. Pinnat,<sup>10</sup> P-E. Pottie,<sup>11</sup> C. Chardonnet,<sup>11</sup> A. Amy-Klein,<sup>11</sup> E. Dierckens,<sup>12</sup> L. Van Loo,<sup>12</sup> N. Ben Soltana,<sup>12</sup> P. Defraigne,<sup>10</sup> *The BOOSTED project: A new infrastructure for time and frequency transfer in Belgium.*

**(1)** Université Libre de Bruxelles ; **(2)** Université Catholique de Louvain ; **(3)** Université de Mons ; **(4)** Université de Lille ; **(5)** Université de Namur ; **(6)** Université de Reims Champagne Ardenne ; **(7)** Royal Belgian Institute for Space Aeronomy ; **(8)** University of Massachussetts Lowell (USA) ; **(9)** Université de Liège ; **(10)** Royal Observatory of Belgium ; **(11)** REFIMEVE ; **(12)** BELNET.