**SUNDAY, JUNE 11 FROM 9:00-15:30**

9:00-12:00
**Calibration**
Åsmund Rinnan & Rasmus Bro, FOOD, Copenhagen University, Denmark

In order to relate the recorded NIR spectrum with reference data, for use in the quality or process control it is necessary to make a calibration model. Partial Least Squares Regression (PLSR) is the major tool for performing such a calibration model. However, even though this to a large extent can be done through the push-button-I-do-not-know-what-I-do principle, a humbler entrance to the whole process will give you more robust and meaningful model in the end. In this course, we will go through the most common pre-processing techniques for NIR spectra, as well as some well-established variable selection techniques. Finally, we will go through a set of common mistakes in calibration building that we have seen several times throughout the years.

12:00-13:30
**LUNCH BREAK**

13:30-15:30
**NIRS in process analytical technology**
Frans van den Berg, FOOD, Copenhagen University, Denmark

NIR has become the workhorse in Process Analytical Chemistry and Technology (PACT) in industry, where ease of sample-instrument interfacing and high measurement frequencies are two of the key factors. However, a successful NIR solution will only be achieved if process dynamics and other production aspects are integrated into the design. In this course we will use real world examples of NIR in continues, semi-continues and true batch processes to better prepare the participant for real-world challenges.

**SCIENTIFIC PROGRAM DAY-BY-DAY**

**Sunday, June 11**

16:30-18:00  **OPENING CEREMONY**

OP01 Welcome by Søren Balling Engelsen & Ana Garrido-Varo
Karl Norris Award

Pierre Dardenne
Walloon Agricultural Research Center (CRA-W), Belgium

18:00-21:00  **WELCOME RECEPTION** (at the exhibition area)

**Monday, June 12**

8:30-9:30  **TOMAS HIRSCHFELD AWARD**

OP02 Development of measurement system for rubber by NIR Spectroscopy

Satoru Tsuchikawa
Nagoya University, Japan

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15:30
**Transfer to Bella Center for opening ceremony and Karl Norris lecture, followed by the opening reception**
10:45-12:00  SESSION: CHEMOMETRICS I
Chair: Tom Fearn
10:45  OP04 Orthogonalisation method for robustness improvement of on-line NIR applications
Sylvie Roussel
ONDALYS, France

11:15  OP05 Drop-D: Dimension reduction by orthogonal projection for discrimination
Jean Michel Roger
Irtsea, France

11:30  OP06 New strategies for local modelling for untarget analysis and regression using Near Infared (NIR) spectroscopic data
Juan-Antonio Fernandez-Pierna
Walloon Agricultural Research Centre, Belgium

11:45  OP07 Batch modelling of NIR data in relative time
Geir Rune Flåtøen
CAMO Software AS, Norway

12:00-13:30  LUNCH & POSTER SESSION
9:45  OP17 Extracting and monitoring particle size distribution information for pharmaceutical crystallisation process using spatially and angularly resolved Visible-NIR Spectra
Yi-Chieh Chen
University of Strathclyde, United Kingdom

10:00  OP18 Qualitative and quantitative monitoring the ethanol precipitation process in human albumin separation by near infrared spectroscopy
Hengchang Zang
Shandong University, China

10:15-10:45  COFFEE BREAK

10:45  OP19 Identification of fengdou produced from different dendrobium species by a handheld NIR Spectrometer based on DLP Technology and Cars-Pisda evaluation
Hui Yan
Jiangsu University of Science and Technology, China

11:15  OP20 Determination of lactase activity using Near-Infrared Spectroscopy
Mathias Schilling
Metrohm AG, Switzerland

11:45  Presentation of ICNIRS2019
Roger Meder
Australia

12:00-13:30  LUNCH & POSTER SESSION

13:30-14:15  PLENARY LECTURE
OP21 Could Near Infrared Spectroscopy be useful to digital agriculture?
Véronique Bellon-Maurel
Irstea, France
14:15-16:45  **SESSION: WATER, SOIL & ENVIRONMENT**  
Chair: Vincent Baeten

14:15  **OP22** Predicting Nutritional Quality for koala habitat assessment using Near-Infrared Spectroscopy  
Jesse Au  
Australian National University, Australia

14:45  **OP23** Use of FT-NIR Spectroscopy for the detection of residues from wood processing industry in the pellet sector  
Manuela Mancini  
Università Politecnica delle Marche, Italy

15:00  **OP24** Potential of polarized Light Spectroscopy to predict rheological parameter of sludges in wastewater treatment plants  
Alexia Gobrecht  
Irstea, France

15:15-15:45  **COFFEE BREAK**

15:45  **OP25** On different roles of water in soft contact lenses – Near Infrared and Aquaphotomics study  
Roumiana Tsenkova  
Kobe University, Japan

16:15  **OP26** Investigation of the feasibility for using NIRS for on-line monitoring of the mineral content and other impurities in reused industrial process water  
Kasper Borg Damkjær  
University of Copenhagen, Denmark

16:30  **OP27** Comparison of two handheld NIR Spectrometers applying PLS-DA and Simca models for determination of the mahogany wood provenance  
Tereza Pastore  
Forest Products Laboratory, Brazil

17:00-18:00  **POSTER SESSION**

19:15-21:15  **Bruker Event – OPEN BAR** sponsored by Bruker  
Auditorium Foyer at Bella Center  
Reception with food & drinks

**Wednesday, June 14**

8:30-9:15  **PLENARY LECTURE:**  
**OP28** NIRS in process control … time is on my side  
Frans van den Berg  
University of Copenhagen, Denmark

9:15-12:00  **SESSION: PROCESS ANALYTICAL TECHNOLOGY**  
Chair: Frederico Marini

9:15  **OP29** Applying extreme value theory on Near Infrared Spectroscopy predictions of moisture content in milk powder  
Peter Skou  
University of Copenhagen, Denmark

9:45  **OP30** From laboratory to the continuous manufacturing line: Update of a NIR Calibration model for tablets' content uniformity evaluation  
Remo Simonetti  
Janssen Pharmaceutical Companies of Johnson & Johnson, Italy
10:00  **OP31** Particle size distribution estimation of suspensions based on bulk scattering properties  
*Annelies Postelmans*  
KU Leuven, Belgium

10:15-10:45  **COFFEE BREAK**

10:45  **OP32** Monitoring of lamination and impregnation procedures in textile processing by Near-Infrared Chemical Imaging  
*Tom Scherzer*  
Leibniz Institute of Surface Modification, Germany

11:15  **OP33** Fusing NIR and process sensors data for polymer production monitoring  
*Marina Cocchi*  
University of Modena and Reggio Emilia, Italy

11:30  **OP34** Model system based scalability test and comparison of NIR and Raman Spectroscopy by the on-line prediction of the glucose concentration of Cho cell cultivations  
*Benze Kozma*  
Budapest University of Technology and Economics, Hungary

11:45  **OP35** Spectroscopic raw material fingerprinting as an early stage step in a monitoring strategy for industrial pectin extraction  
*Ricardo Caroco*  
Technical University of Denmark (DTU), Denmark

12:00-13:30  **LUNCH & POSTER SESSION**

13:30-14:15  **PLENARY LECTURE**

**OP36** How to stop worrying about calibrations and embrace the benefits of NIR?  
*Daniel Cozzolino*  
Central Queensland University, Australia

14:15-16:45  **SESSION: AGRICULTURE**  
Chair: Dolores Perez-Marin

14:15  **OP37** Random forest approach for modelling on-line VIR-NIR Spectroscopy of soil total nitrogen and total carbon for different scale datasets  
*Said Nawar*  
Cranfield University, United Kingdom

14:45  **OP38** Classification of citrus fruit with ensemble techniques  
*Kerry Walsh*  
Central Queensland University, Australia

15:00  **OP39** Application of local regression methods to NIR Spectra database of citrus fruits for the assessment of internal quality  
*María-Teresa Sánchez*  
University of Cordoba, Spain

15:15-15:45  **COFFEE BREAK**

15:45  **OP40** Performance comparison of bench-top, Hyperspectral Imaging, hand-held and pocket NIR Spectrometers: The example of protein quantification in wheat  
*Vincent Baeten*  
Walloon Agricultural Research Center (CRA-W), Belgium

16:15  **OP41** Calibrations for the determination of minor fiber components  
*Franklin Barton*  
LLS Instruments, Inc., United States of America

16:30  **OP42** Classification of citrus fruit with ensemble techniques  
*Eloise Keeffe*  
Sugar Research Australia, Australia

16:45-18:00  **POSTER SESSION**

19:30-00:00  **Gala Dinner at Langelinie Pavillonen**  
Ticket required.  
Transfer departures from Bella Center at 18:30!
Thursday, June 15

8:30-9:15  PLENARY LECTURE

**OP43** Theoretical and technical advancements of NIRS and its operational impact in industry

![Christian Huck](christian_huck.png)

Christian Huck
Universität Innsbruck, Austria

9:15-10:15  SESSION: THEORY & INSTRUMENTATION

Chair: Franklin Barton


*Tine Ringsted*
University of Copenhagen, Denmark

9:45  **OP45** A handheld multispectral sensor for the separation of scattering and absorption properties

*Robbe Van Beers*
KU Leuven – MeBioS, Belgium

10:00  **OP46** Towards imaging Micro-Spectrometers for airborne applications

*Dilusha Silva*
The University of Western Australia, Australia

10:15-10:45  COFFEE BREAK

10:45-12:00  SESSION: CHEMOMETRICS II

Chair: Åsmund Rinnan

10:45  **OP47** Setting local rank constraints using orthogonal projections for Image Resolution Analysis: Application to the determination of a low dose pharmaceutical compound

*Nathalie Gorretta*
Irstea, France

11:15  **OP48** In the neighborhood: Advances in local modeling for calibration and classification

*Federico Marini*
University of Rome “La Sapienza”, Italy

11:30  **OP49** Classification with NIR Spectra using Bayes rule and kernel density estimates

*Tom Fearn*
University College London, United Kingdom

11:45  **OP50** Near Infrared Calibration with linear mixed models

*Sharon Nielsen*
Charles Sturt University, Australia

12:00-13:30  LUNCH & POSTER SESSION

13:30-14:15  PLENARY LECTURE

**OP51** Clinical Neuro-Monitoring with Diffuse Correlation Spectroscopy

![Maria Angela Franceschini](maria_angela_franceschini.png)

Maria Angela Franceschini
Harvard Medical School, United States of America
SESSION: HYPERSPECTRAL IMAGING
Chair: José Manuel Amigo

14:15
**OP52** On-line detection of wooden breast syndrome in chicken fillets by Hyperspectral NIR Imaging
Jens Petter Wold
Nofima, Norway

14:45
**OP53** Data dimensionality reduction strategies for fast exploration and classification of large datasets of Hyperspectral Images
Rosalba Calvini
University of Modena and Reggio Emilia, Italy

15:00
**OP54** Cross-polarised VNIR Hyperspectral Reflectance Imaging for mapping moisture content and texture of banana slices during drying
Nghia Nguyen Do Trong
KU Leuven, Belgium

15:15-15:45 COFFEE BREAK

15:45
**OP55** Bacteria cell classification with Hyperspectral Microscope Imaging and multivariate analysis
Matthew Eady
US Department of Agriculture, United States of America

16:15
**OP56** Hyperspectral Imaging of lateritic nickel deposits in New Caledonia
Erick Ramonaidou
CSIRO, Australia

16:30
**OP57** Increased sensitivity in NIR Hyperspectral Imaging by enhanced background noise subtraction
Torbjørn Mehl
Norwegian University of Life Sciences, Norway

16:45-17:30 CLOSING CEREMONY
Highlights from ICNIRS2017
Farewell and see you again in Australia for ICNIRS2019!