



## Space & Scientific CMOS Image Sensors



**WORKSHOP**  
26<sup>th</sup> & 27<sup>th</sup>  
November 2024



### DIAGORA

Centre de Congrès et d'Exposition. 150, rue Pierre Gilles de Gennes  
31670 TOULOUSE – LABEGE

**PRELIMINARY  
PROGRAMME**

Co-organised by CNES, ESA,  
AIRBUS DEFENCE & SPACE, THALES ALENIA SPACE, SODERN, OHB  
ISAE-SUPAERO

# Tuesday 26<sup>th</sup> November

09:30 WELCOME COFFEE

09:50 INTRODUCTION  
*A. Materne, CNES, Toulouse*

10:00 TUTORIAL  
**Photon-number-resolving image sensors**  
*L. Durdevic – Hamamatsu Photonics, Paris - France*

SESSION *Low Flux*  
*Chair: N. Nelms ESA*

10:50 **Analysis of Temporal Noise of 1×2 Shared Pixel Architecture for On-Chip Averaging and Summing**  
*H. Uppal, A. Kumar, S. Gopalakrishna, R. Ispasoiu – Onsemi, Intelligent Sensing Group*

11:10 **Short Wave Avalanche Photo diodes**  
*D. Owton, I. Baker, C. Maxey, M. Hicks – Leonardo, Southampton, UK*

11:30 **Photon counting 2D tracking and communication detector from Leonardo**  
*D. Owton, I. Baker, C. Maxey, A. Malik, M. Hicks, – Leonardo, Southampton, UK*  
*S. Mejri – ESA, The Netherlands*

11:50 **Radiation Effects in Quanta Image Sensors**  
*J. Krynski, A. Neyret, A. Le Roch, V. Goiffon – ISAE-SUPAERO, Toulouse, France*  
*V. Bernard, V. Laluca, A. Materne, C. Virmondois – CNES, Toulouse, France*

12:10 LUNCH

SESSION *Radiations*  
*Chair: S. Rizzolo Airbus D&S*

13:40 **Radiation test results on a large COTS CMOS Global Shutter Image sensor**  
*A. Materne, C. Virmondois, JP. Millerieux, R. Ecoffet – CNES, Toulouse, France*  
*A. Maillard - Astek, Toulouse, France*  
*L. Pelissier – Expleo Group, Toulouse, France*  
*V. Chazal, Thales Six GTS, Toulouse, France*

14:00 **TNID and Heavy Ions Irradiations Study on the GigaPyx COTS CIS sensor**  
*J. Michelot, M. Douix, JB. Mancini, M. Guillon – Pyxalis, Moirans, France*  
*K. Melendez, C. Ravinet, M. Jouans, G. Estaves, R. Marec, S. Demiguel – Thales Alenia Space, Cannes, France*  
*A. Materne, C. Virmondois - CNES, Toulouse, France*

14 :20 **Displacement Damage Induced Dark Current and Random Telegraph Signal in P-Type Deep-Trench Pinned Photogates**  
*A. Antonsanti, A. Salih Alj, A. Le Roch, V. Goiffon - ISAE-SUPAERO, Toulouse France*  
*V. Malherbe, P. Roche, A. Tournier – STmicroelectronics, Crolles, France*  
*L.D. Ryder, JM. Lauenstein - NASA GSFC, USA*  
*C. Virmondois – CNES, Toulouse, France*

14 :40 **Displacement Damage Effects on a CDTI-based CCD-on-CMOS: Dark Current and Charge Transfer Inefficiency**  
*A. Salih Alj, A. Antonsanti, A. Le Roch, P. Magnan, V. Goiffon – ISAE-SUPAERO, Toulouse, France*  
*P. Tournon, F. Roy, A. Tournier – Stmicroelectronics, Crolles, France*  
*S. Demiguel – Thales Alenia Space, Cannes, France*  
*J. Michelot – Pyxalis, Moirans, France*  
*V. Laluca, C. Virmondois, CNES, Toulouse, France*

15 :00 **Radiation tolerant event-based asynchronous image sensor**  
*P. Adamiec, E. Cordero Garrido – ALTER TECHNOLOGY, Tres Cantos, SPAIN*  
*J.A. Leñero, R. Gómez Merchán, R. del la Rosa Vidal - Institute of Microelectronics of Seville (IMSE-CNM), CSIC-Universidad de Sevilla, Seville, Spain.*

15:20 BREAK

SESSION

Technology Development  
Chair: K. Minoglou ESA

15:50 **Enhanced optical filter technologies for compact multi-mode spectral imaging payloads for earth observation**  
*B. Delauré, B. Geelen, K. Tack, W. Charle – IMEC, Leuven, Belgium*

16:10 **Process of linear variable filter designed for compact imaging spectrometer for space observatory**  
*C. Jamin, A. Arribehaute, JP. Nieto - Univ. Grenoble Alpes, CEA, Leti, Grenoble, France  
A. Carcenac, S. Gousset, E. Le Coarer - Institut de Planétologie et d'Astrophysique de Grenoble, Saint-Martin-d'Hères, France,*

16:30 **Recent Multispectral Sensors Developments for Space Applications**  
*S. Tisserand, T. Berthou, M. Hubert, V. Sauget, S. Gautier, A. Faiola, B. David – SILIOS Technologies, Peynier, France*

16 :50 **Multispectral Cameras for Moon Rover**  
*J. Bezine, MC. Vassal, W. Durand-Mouallem – 3DPlus, Buc, France  
JM. Belloir, C. Virmontois - CNES Toulouse, France  
S. Tisserand, M. Hubert, S. Gautier, V. Sauget – SILIOS Technologies , Peynier, France  
K. Tack, B. Delaure, W. Charle - IMEC, Leuven, Belgium  
R. Ligot, JL. Dewandel – LAMBDA-X, Nivelles, Belgium  
LS. How – Adveotec, Evry Courcouronnes, France*

17 :10 **Teledyne e2v technology developments: CIS120, CIS220 (HiRho) and CIS300 (Large Area CMOS) performance results**  
*G. Tsiolis – Teledyne e2v, Chelmsford, UK*

17:30 **A monolithic thin-film image sensor with lead sulfide quantum dots coated on CMOS silicon readout for wide-spectral imaging**  
*CM. Zhang, R. Quaglia, P. Blanca Cruz, PF. Ruedi - CSEM, Neuchatel, 2002, Switzerland  
A. Shulga, V. Goossens – QDI Systems, Groningen, The Netherlands  
A. Al-Haj Husain, B. Stadlinger - Clinic of Cranio-Maxillofacial and Oral Surgery, Center of Dental Medicine, University of Zurich, Switzerland*

18:00 DRINKS RECEPTION – HIGH-BAY

## Wednesday 27<sup>th</sup> November

09:00 WELCOME COFFEE

09:30 **TUTORIAL**  
**The Timepix Family of Hybrid Pixel Detectors and Applications in Measurement of Space Radiation**  
*R. Ballabriga, M. Campbell, , X. Llopart – CERN, Geneva, Switzerland  
C. Granja - ADVACAM, Prague, Czech Republic*

SESSION

CMOS for Time stamping  
Chair: O. Marcelot ISAE-SUPAERO

10:20 **Development of a LIDAR Receiver Unit: LIROC- PICOTDC**  
*T. Saleem, S. Ahmad, A. Hadar, F. Perez, J. Fleury – WEEROC, Villebon sur Yvette, France  
A. Panglosse, A. Materne, CNES, Toulouse, France*

**10:40** **FLAMES: A Flash LidAr iMage Sensor chip for Rendez-vous and Landing applications**  
*J. Vermeiren, V. Schuddinck, G. Cai, B. De Schepper, B. Dierick, J. Basteleus – Caeleste, Mechelen Belgium*  
*K. Haugholt, H. Tarring, B. Nossun – SINTEF, Norway*  
*M. Somann – ESA-ESTEC, The Netherlands*

**11:00** **Towards Characterizing Spatial Contrast Transfer in Event-Based Cameras**  
*L. Baehr, D. Joubert, F. Le Goff – Prophesee, France*  
*L. Baehr, M. Estribeau, V. Goiffon – ISAE-SUPAERO, Toulouse, France*

**11:20** BREAK

**SESSION** Architectures  
Chair: S. Demiguel Thales Alenia Space

**11:50** **Design and characterisation of a full-frame low-noise HDR 8µm, 12Mpixel, 34fps CMOS image sensor for industrial, medical, space and scientific applications**  
*M. Sannino, C. Bauza-Alcover, A. Font-Garcia, R. Gifreu-Pons, M. Gargallo, M. Giulioni, K. Latif Akhtar, O. Lladós-Cos, A. Molla-Garcia, V. Palmero-Arans, A. Scott, R. Turchetta, A. Bofill-Petit – IMASENIC, Barcelona, Spain*  
*D. Uzbekel Feldman – Real Time Imaging Technologies, Charlotte USA*  
*E. Simons – Blur Product Development, Cary, USA*  
*A. Birman – Tower Semiconductor, Migdal Haemek, Israel*

**12:10** **CMOS TDI Detectors for High Resolution Imaging**  
*S. Sanjeevi, V. Arkesteijn, L. Wu, C. Hong, HJ. Lee, G. Rodrigues, M. Miethig, R. Ghannoum, P. Donegan, S. Kullar – Teledyne DALSA, Waterloo, CANADA*

**12:30** **Infrared FPA Readout System with the NIRCA MkII ASIC**  
*A. Fagerland Haavik, T. Ostmo, A. Hasanbegovic, D. Meier, B. Samadpoor Rikan, T. Nesjo, HK. Otnes Berge, A. Dadashi, S. Azman, J. Talebi, JE. Holter, P. Oya, G. Maehlum – IDEAS, Oslo, Norway*

**12:50** **5 µm Pixel and Column ADC for 1 MGy Radiation Tolerant CMOS Image Sensor**  
*I. Hafizh, P. Santos, P. Leroux, and G. Meynants – KU Leuven, Belgium*

**13:10** LUNCH

**SESSION** CMOS for Scientific Applications  
Chair: A. Vriet Sodern

**14:20** **CMOS X-ray Sensors for Future Space Astronomy and Planetary Science**  
*A. Holland, T. Buggé, C. Crews, D. Hall, J. Ivory, C. Townsend-Rose, K. Stefanov - Centre for Electronic Imaging, The Open University, UK*

**14:40** **CMOS Sensors for Scientific Imaging at the CEI**  
*K. Stefanov, T. Buggé, C. Crews, D. Hall, A. Holland, J. Ivory, M. Patel, M. Prest, J. Skottfelt, P. Smith - Centre for Electronic Imaging, The Open University, UK*

**15:00** **The ARCADIA Depleted Monolithic Active Pixel: X-ray characterization and imaging applications**  
*S. Ciarlanti, C. Bonini, D. Chiappara, P. Giubilato, S. Mattiazzo, C. Pantouvakis, M. Rignanese, and A. Zingaretti – University of Padova, Italy - Istituto Nazionale di Fisica Nucleare (INFN), Padova section, Italy*

**15:20** **Fast & low read noise CMOS camera for planetary science and astrophysics**  
*MM. Roth - Deutsches Zentrum für Astrophysik (DZA), Görlitz Leibniz-Institut für Astrophysik Potsdam (AIP) Universität Potsdam, Germany*

**15:40** WORKSHOP END

## Registration link

<https://evenium.events/space-and-scientific-cmos-image-sensors-2024/>

## Industrial Exhibitors

The following companies will be exhibiting at the Workshop :

**3Dplus** – <https://www.3d-plus.com>

**Silios** – <https://www.silios.com>

**Teledyne e2v** – <https://www.teledyne-e2v.com>

**Pyxalis** - [Home page - Pyxalis](#)

## Workshop location

[Diagora Congress Center | DIAGORA \(diagora-congres.com\)](#)

## Hotels close to the Workshop location

[Liste des hôtels | DIAGORA \(diagora-congres.com\)](#)

## Workshop format & official language

Oral presentation shall be requested for the workshop. The official language for the workshop is English.

## Slide submission

After abstract acceptance notification, the author(s) will be requested to prepare their presentation in pdf or Powerpoint file format, to be presented at the workshop and to provide a copy to the organizing committee with an authorization to make it available for all attendees, and on-line for the CCT members.

## Registration

Registration fee : 100 €

Students : 50 €

## Calendar

8th November 2024	Final programme
26th-27th November 2024	Workshop

## Organizing committee

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