



Space & Scientific CMOS Image Sensors



WORKSHOP
26th & 27th
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 26th November

09:30 WELCOME COFFEE

09:50 INTRODUCTION
A. Materne, CNES, Toulouse

10:00 TUTORIAL
Photon-number-resolving image sensors
M. Kehr – Hamamatsu Photonics, Munchen, Germany

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. Virmonois – 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. Virmonois, 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. Virmonois - 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. Virmonois – 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. Virmonois, 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 27th 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. Topping, 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

14:30 **The ARCADIA Depleted Monolithic Active Pixel: X-ray characterization and imaging applications**
S. Ciarlantini, 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

14:50 **CMOS Sensors for Scientific Imaging at the CEI**
K. Stefanov, T. Bugghey, C. Crews, D. Hall, A. Holland, J. Ivory, M. Patel, M. Prest, J. Skottfelt, P. Smith - Centre for Electronic Imaging, The Open University, UK

15:10 **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

15:30 **CMOS X-ray Sensors for Future Space Astronomy and Planetary Science**
A. Holland, T. Bugghey, C. Crews, D. Hall, J. Ivory, C. Townsend-Rose, K. Stefanov - Centre for Electronic Imaging, The Open University, UK

15:50 WORKSHOP END

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 \(diagora-congres.com\)](#)

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 €

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

Calendar

4th October 2024	Author notification
11th October 2024	Preliminary programme
14 th October 2024	Registration opening
8 th November 2024	Final programme
26 th -27 th November 2024	Workshop

Organizing committee

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