

SENSE - a roadmap for the ideal low light level sensor development

WP2: R&D Cooperation



UNIVERSITÉ

DE GENÈVE

¹ University of Geneva, DPNC, 24, Quai Ernest-Ansermet - CH-1211 Genève 4 - Switzerland ² MPG - Max-Planck-Institute for Physics, Foehringer Ring 6 80805 Munich, Germany ³KIT - Karlsruhe Institute of Technology, Karlsruhe, 76021, Germany ⁴ DESY - Deutsches Elektronen-Synchrotron, Notkestrasse 85, 22607, Hamburg, Germany ⁵ Nagoya University, Furo-cho, Chikusa-ku, Nagoya 464-8601, Japan ⁶ INAF- Catania Astrophysical Observatory, Via S. Sofia, 78 I-95123 Catania, Italy

⁴T. Berghofer, ⁵H. Tajima, ⁶G. Bonanno, ⁶G. Romeo, ⁷H.C. Schultz-Coulon, ⁷W. Shen

⁷ University of Heidelberg, Im Neuenheimer Feld 227 Kirchhoff Institute for Physics 69120 Heidelberg Germany

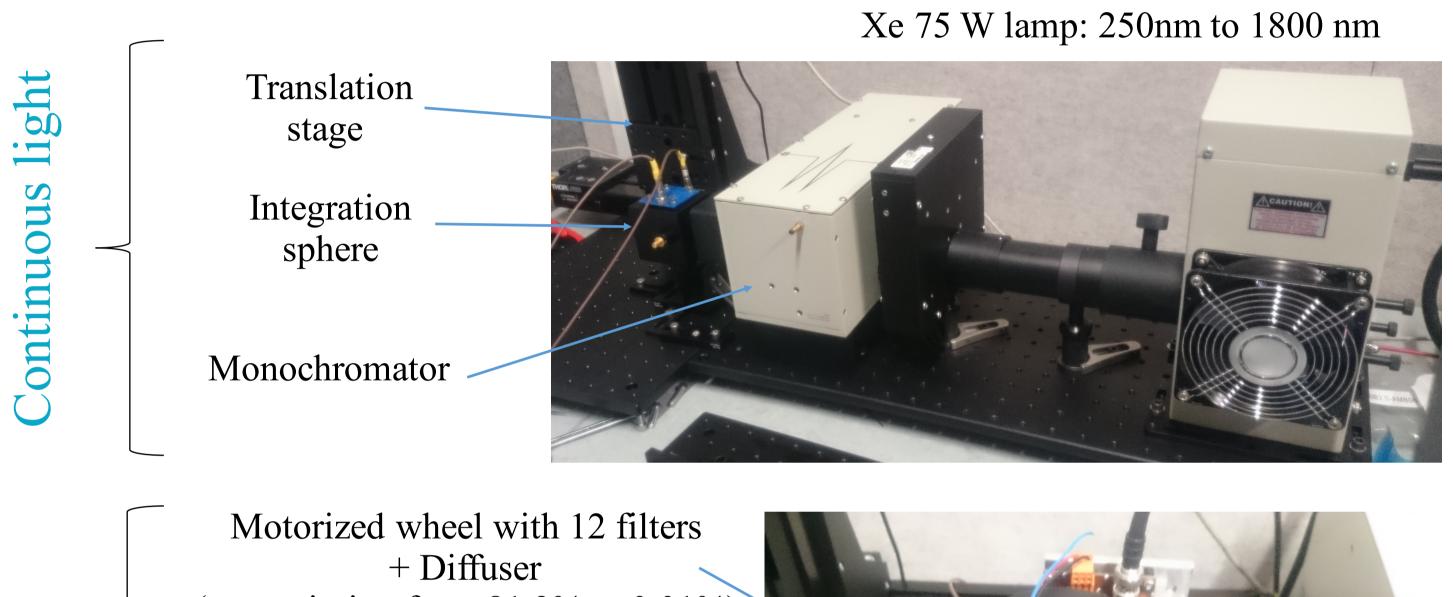
SENSE - a roadmap for the ideal low light level sensor development is a project funded by the European Commission under Future and Emerging Technologies (FET) Open Coordination and Support Action (CSA) (https://www.sense-pro.org).

It aims at coordinating, monitoring, and evaluating the R&D efforts of research groups and industry in advancing low light level (LLL) sensors and liaise with strategically important European initiatives and research groups and companies worldwide. The project's objectives are: (1) to conduct the development of a European R&D roadmap towards the ultimate LLL sensors, and to monitor and evaluate the progress of the development with respect to the roadmap, (2) to coordinate the R&D efforts of research group and industry in advancing LLL sensors and liaise with strategically important European initiatives and research groups and companies worldwide, (3) to transfer knowledge by initiating information and training events and material, (4) to disseminate information by suitable outreach activities.

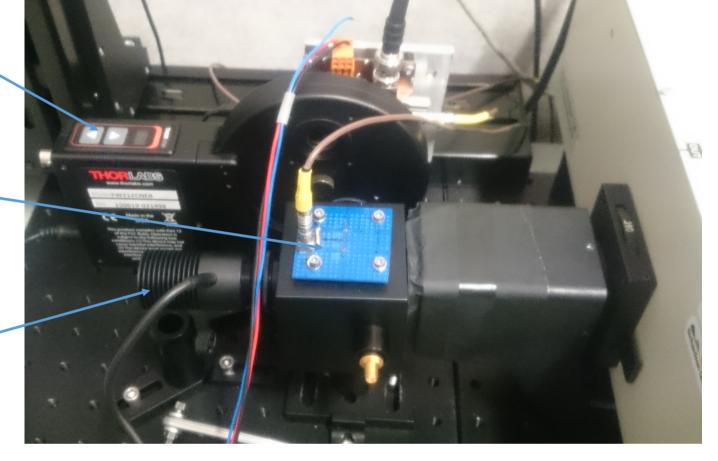
SENSE structure

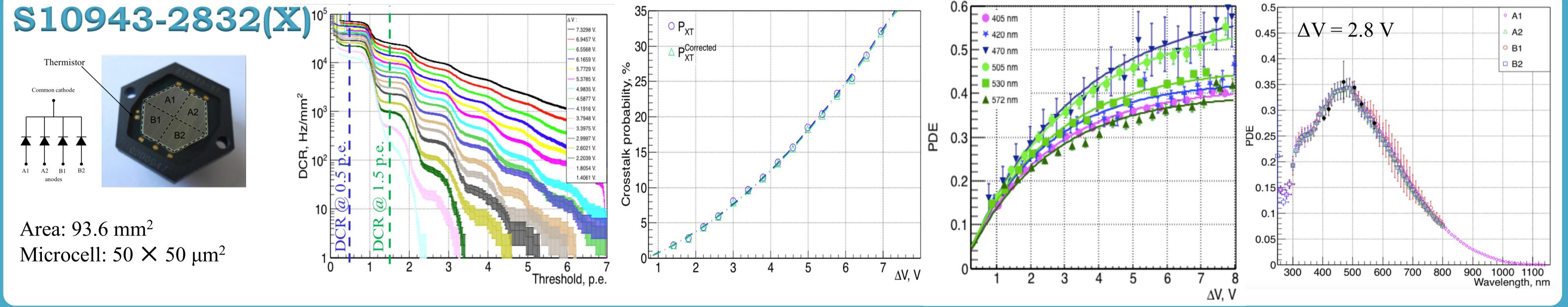
European Coordinator Commission Katharina Henjes-Kunst **Expert Group Project Team** UNIVERSITÉ DE GENÈVE WP 1 WP 2 WP 3 WP 4 WP 5 Roadmapping & **R&D** Cooperation **Project Management** Outreach & TEP Training & Learning Monitoring Teresa Montaruli **Andreas Haungs** Katharina Henjes-Kunst Katharina Henjes-Kunst Razmik Mirzoyan Domenico Della Volpe Thomas Berghöfer Thomas Berghöfer Astrid Chantelauze Andrii Nagai T1.1 T2.1 T3.1 T5.1 Creation of a Concept for Summer Agreement on R&D Development of a Overall Management European R&D Cooperation Schools Technology Exchange Roadmap for LLL Platform (TEP) sensors T4.2 T2.2 Implement TEP Lining to other T3.2 Training Section European Initiatives T1.2 Extension and Monitoring & Moderation of TEP Evaluation of R&D T2.3 T4.3 Progress Fostering the LLL Technology T3.3 Exchange betweer Training Events Website, Newsletter & Academia and Social Media Industry

Experimental part



(transmission from 81.3% to 0.01%) light Photodiode 10 × 10 mm² (S1337-1010BQ) Pulsed LED's: 280, 340, 375, 405, 420, 455, 470, 505, 525, 530, 565 & 572 nm





LVR-3050CS0.8F UNIGE: UNIGE @ 405 nm Continuous Light Nagoya Pulsed Light Catania Catania Continuous Light B0.3 Pulsed Light Nagoya Area: $3 \times 3 \text{ mm}^2$ $\Delta V = 3 V$ Catania Microcell: $50 \times 50 \,\mu\text{m}^2$ 300 400 500 600 700 800 900 1000 Wavelength, nm

LVR-6050CS¹⁸E UNIGE: UNIGE Continuous Light Catania Pulsed Light obability, 0.4 rosstalk 10 0.2 UNIGE Area: 6 X 6 mm² $\Delta V = 3 V$ Catania Microcell: $50 \times 50 \,\mu\text{m}^2$ 300 400 500 600 700 800 900 1000 Wavelength, nm

Conclusions:

- The experimental setup was build & calibrated:
 - o DCR(ΔV , $V_{Thr.}$), $P_{XT}(\Delta V)$, PDE(ΔV , λ);
- Cooperation agreement institutes between established;
- MPPC devices were distributed between institutes;

Future activities:

- Evaluate systematic errors for each experimental setup;
- Establish measurements and analysis procedures;
- Involve industries;