

Sarah Bugby

Loughborough University

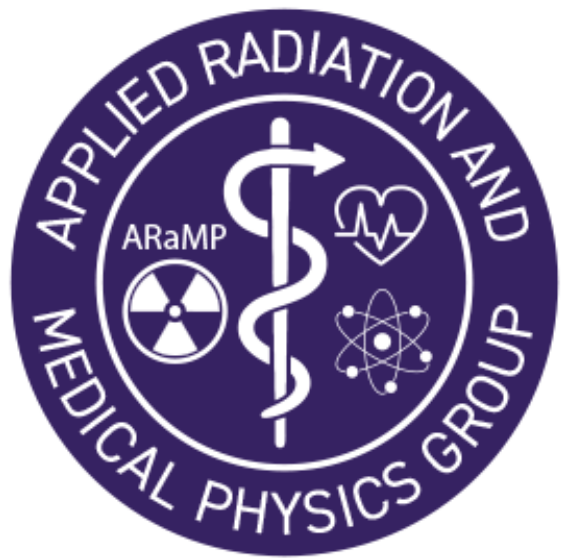
Photon counting with Columnar CsI

COST ACTION CA24131

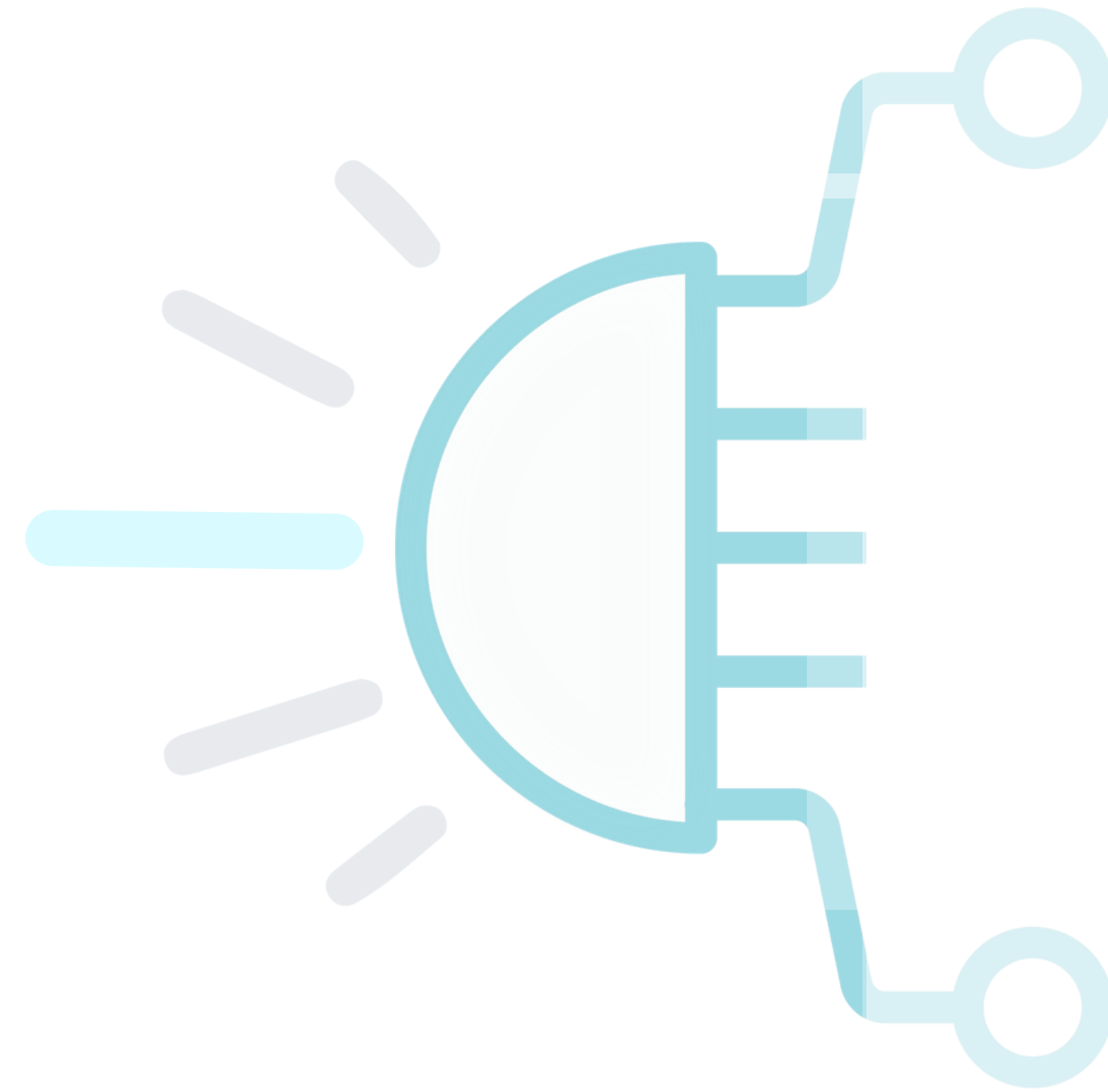
European Network for radiation-detection based Research and
Innovation addressing increasing societal CHallenges (ENRICH)

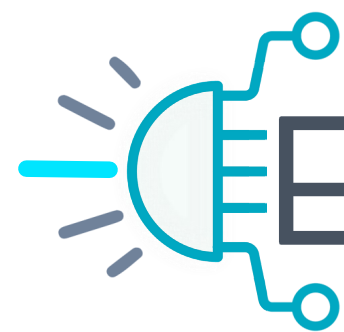
ENRICH

- 8 Queen's Anniversary Prizes
- 35 medals at Paris 2024 Games
- Applications and instrumentation
- Material characterisation; HF-CdZnTe, perovskites
- Charge sharing
- Transition edge sensors



1. Motivation
2. Initial imaging system design
3. Technological advancements
4. Performance of new system
5. Current status and future work





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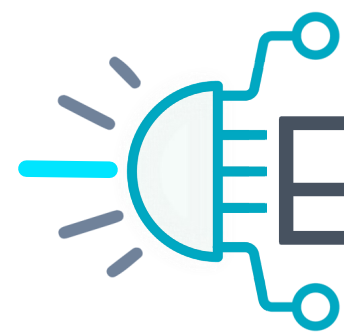
Motivation: Intraoperative radioguidance

Intraoperative imaging requirements:

- 141 keV photons
- 10kBq – 10 MBq
- 1mm source, 5mm separation
- 5cm – 20cm FOV
- 'Real-time' feedback
- Quantification
- Self-contained, light, portable, IP67 rated



Video credit: Donald McCain, Cancer Surgery Associates.



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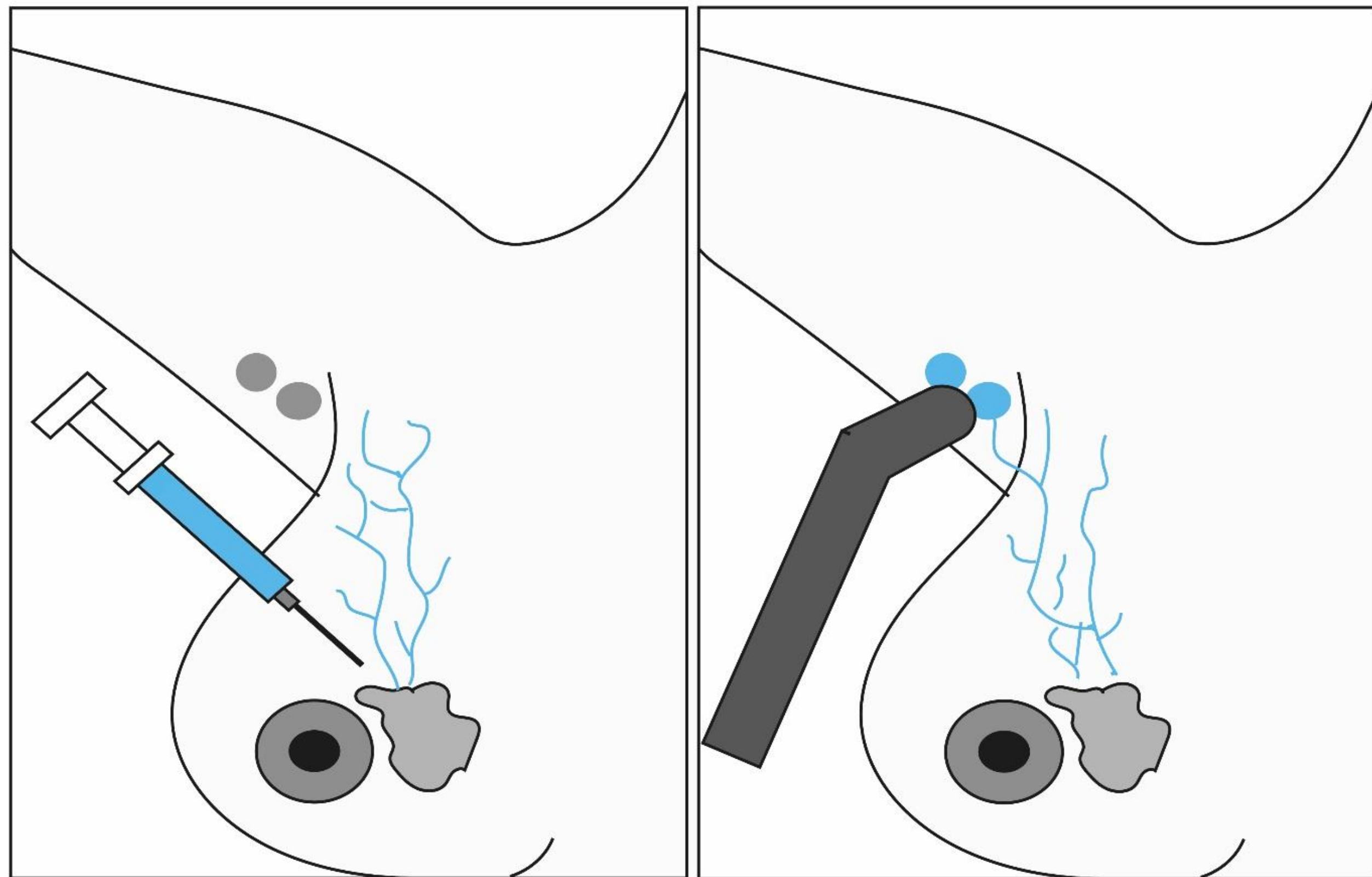
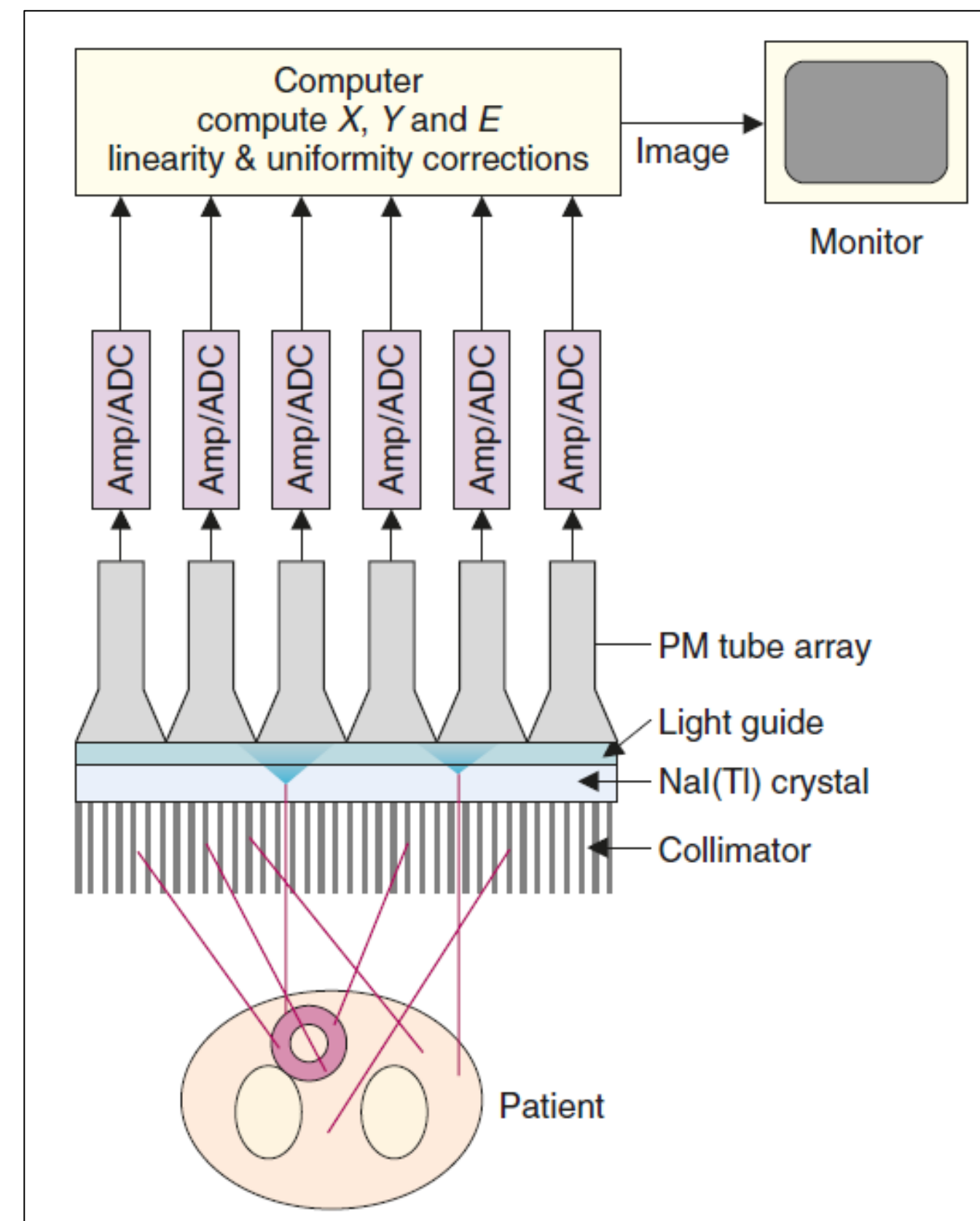
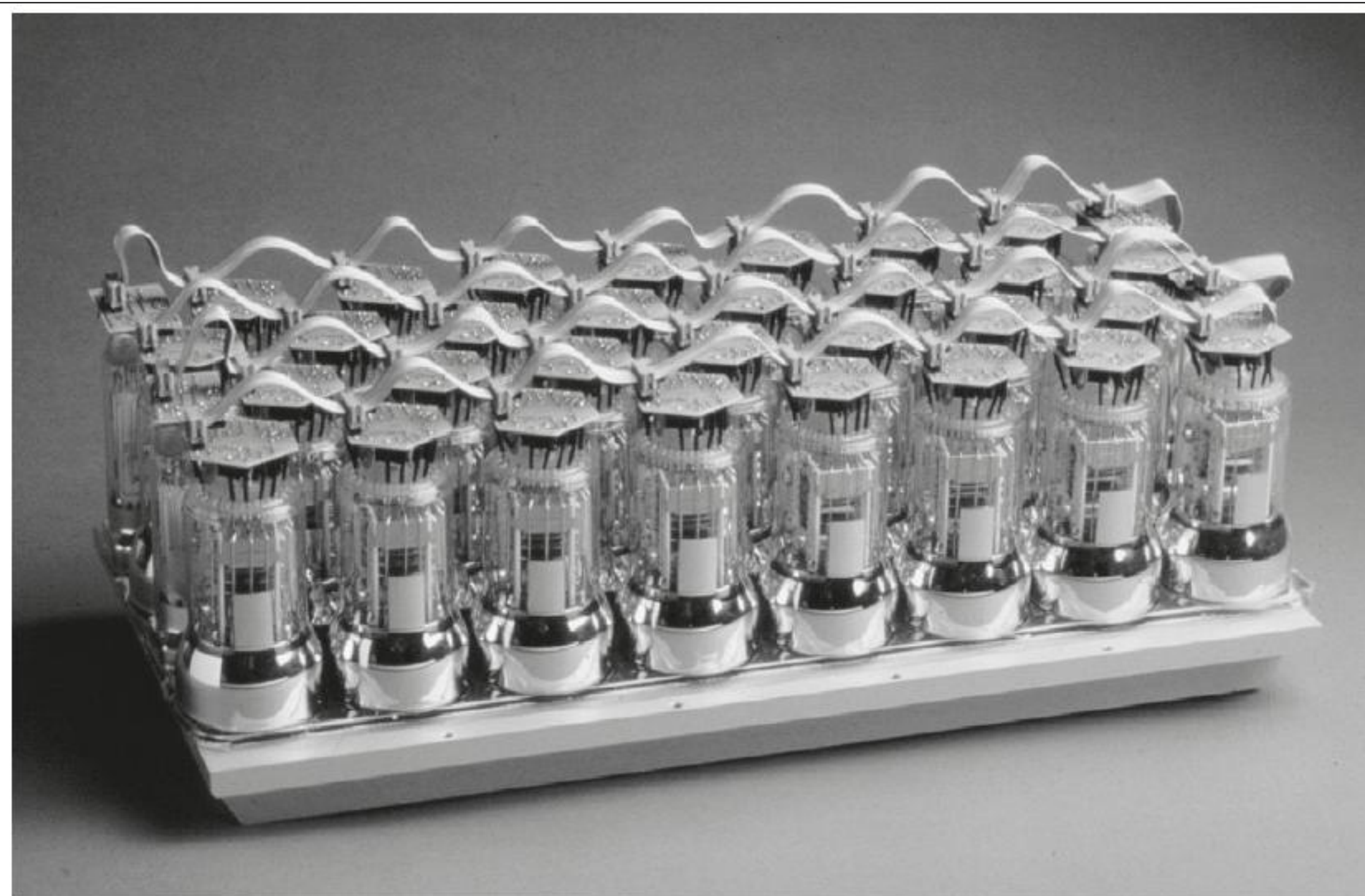
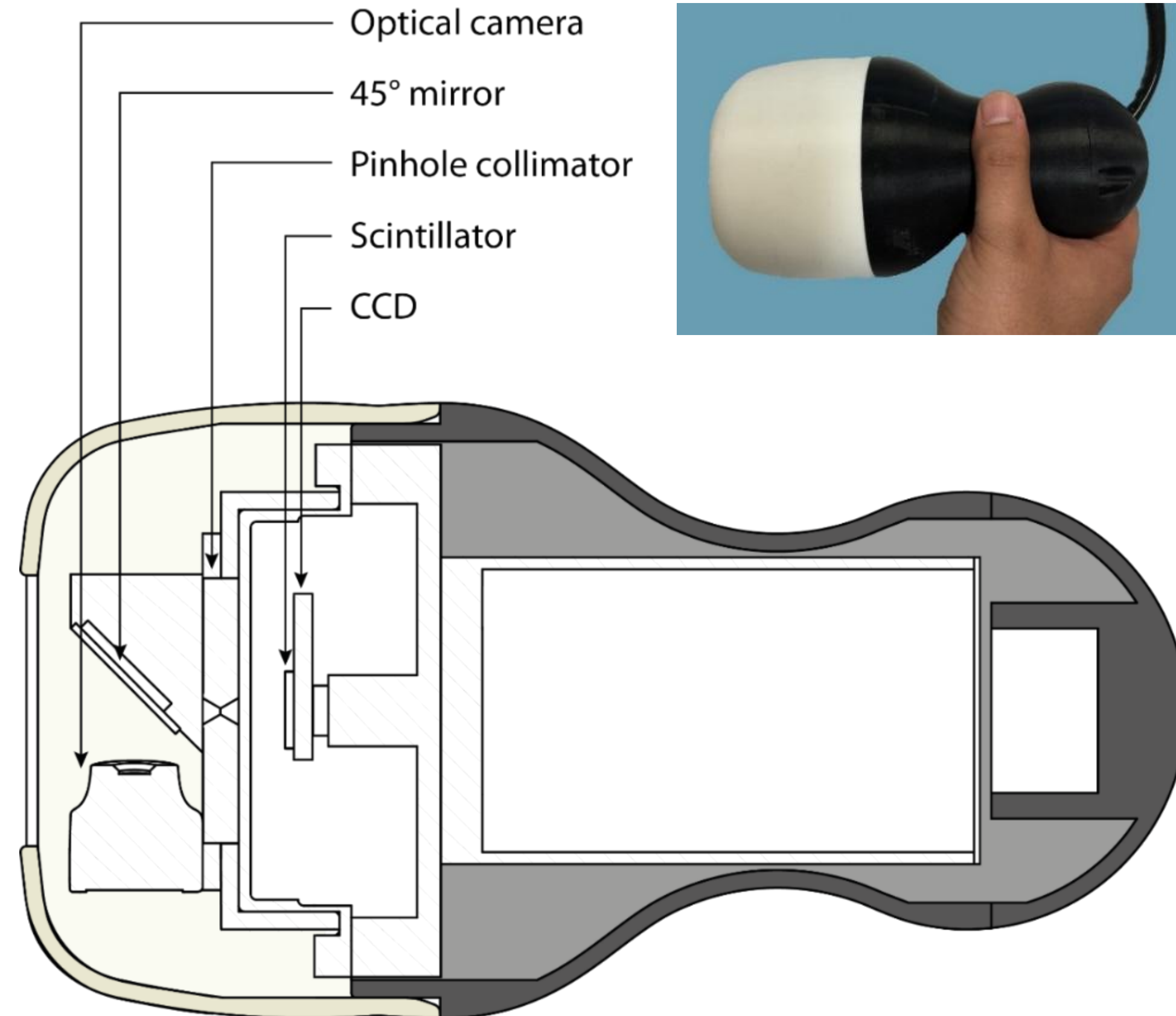
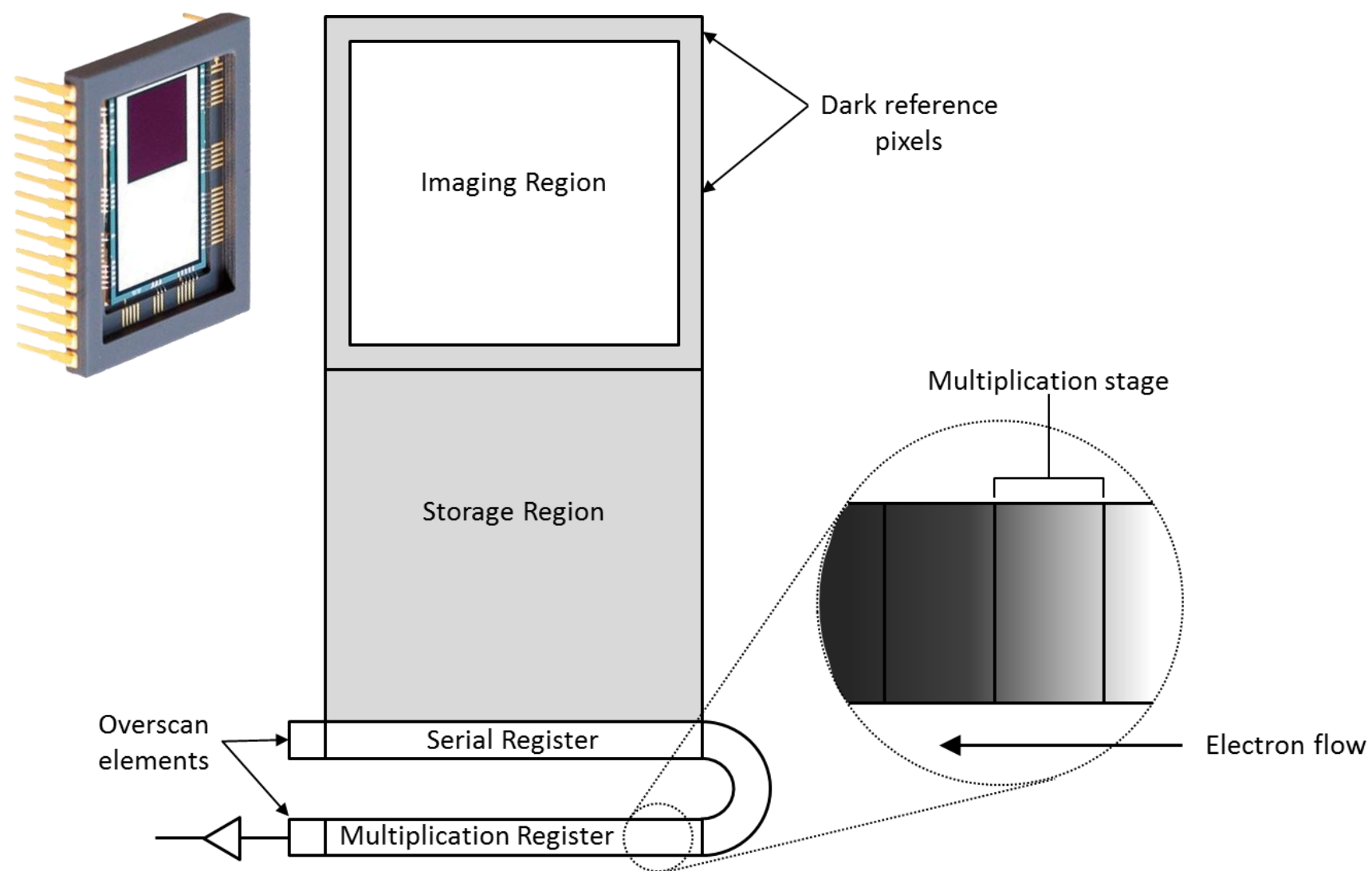


Image credit: Carla Hope, University of Nottingham.





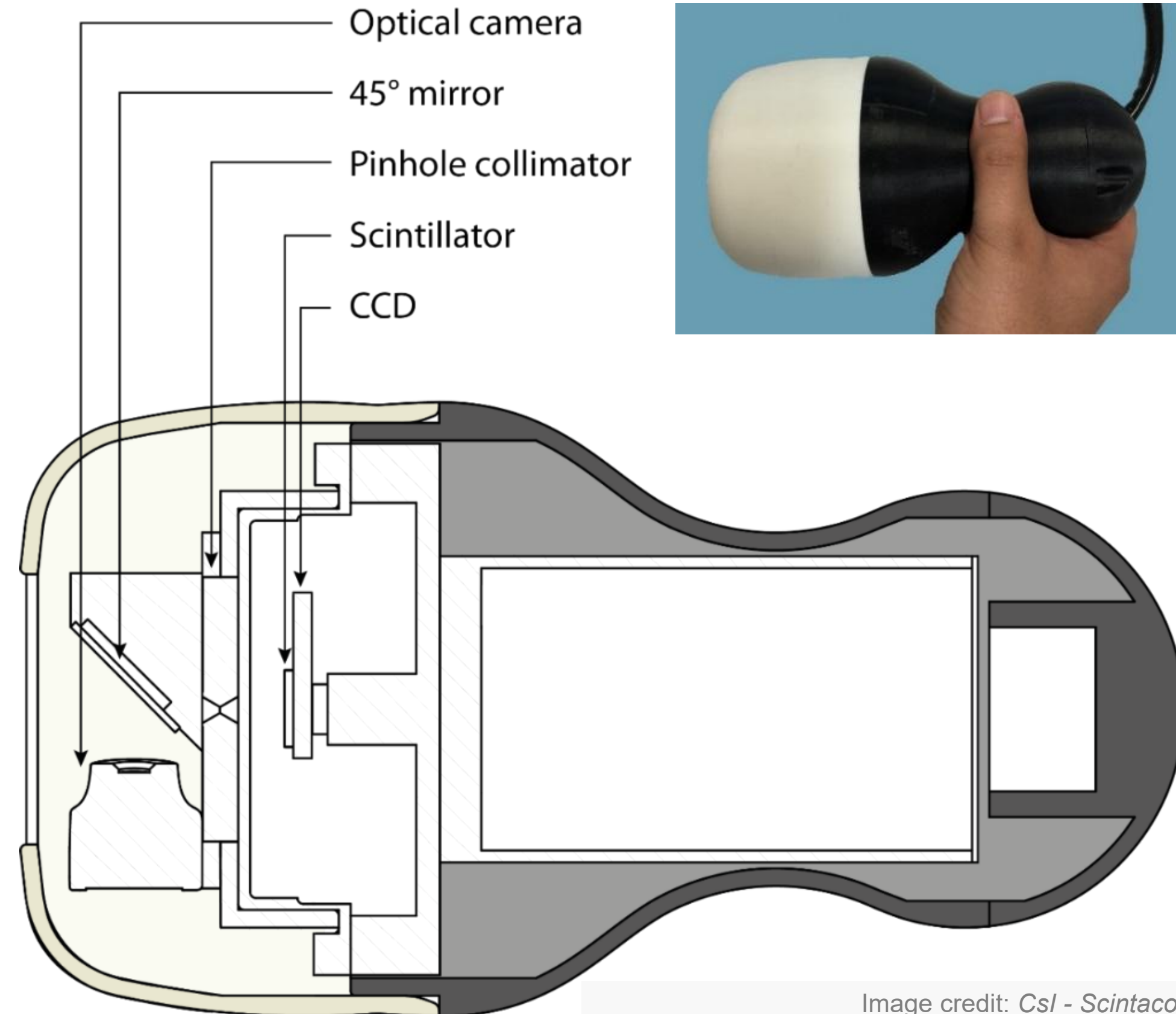
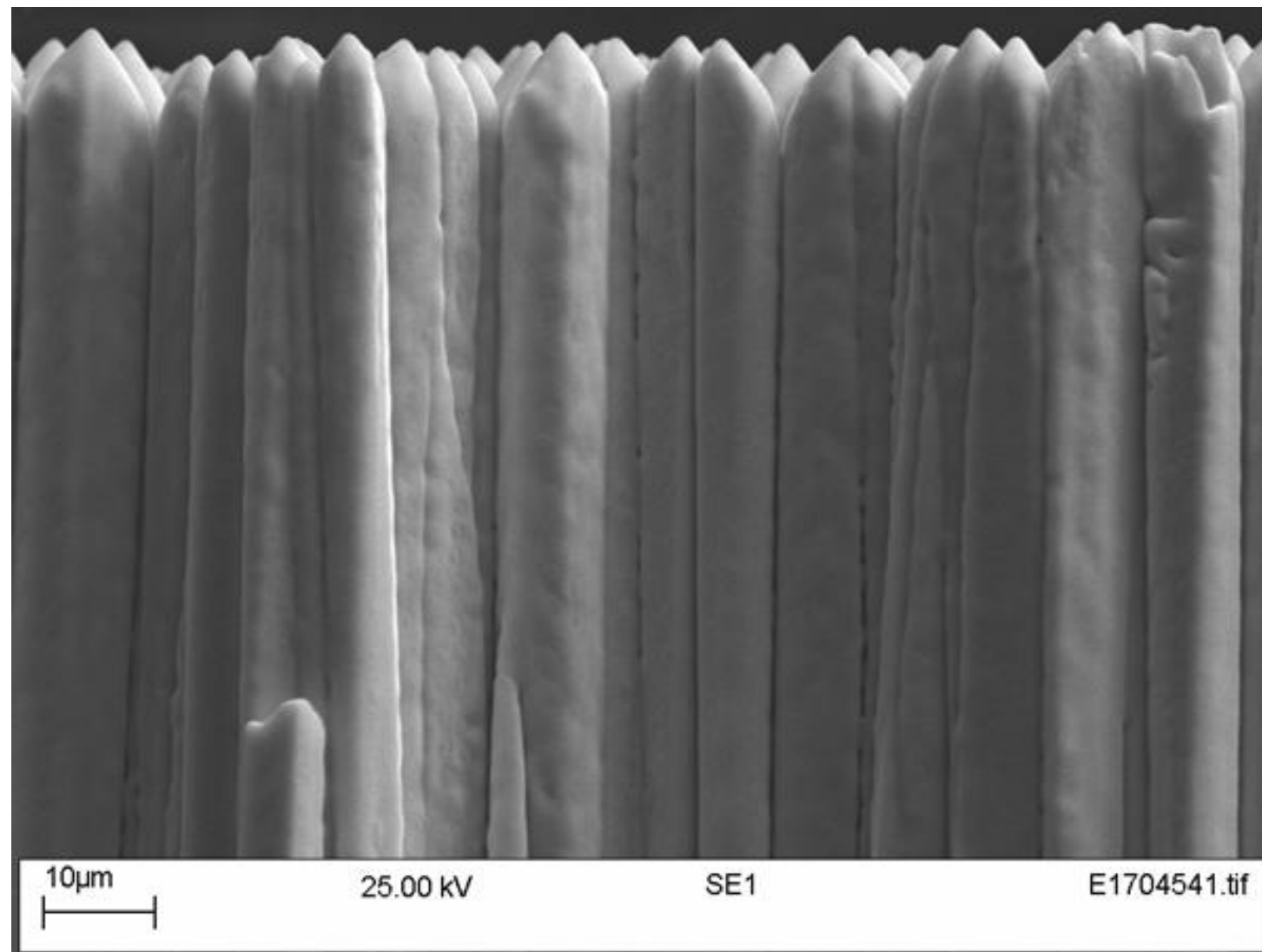
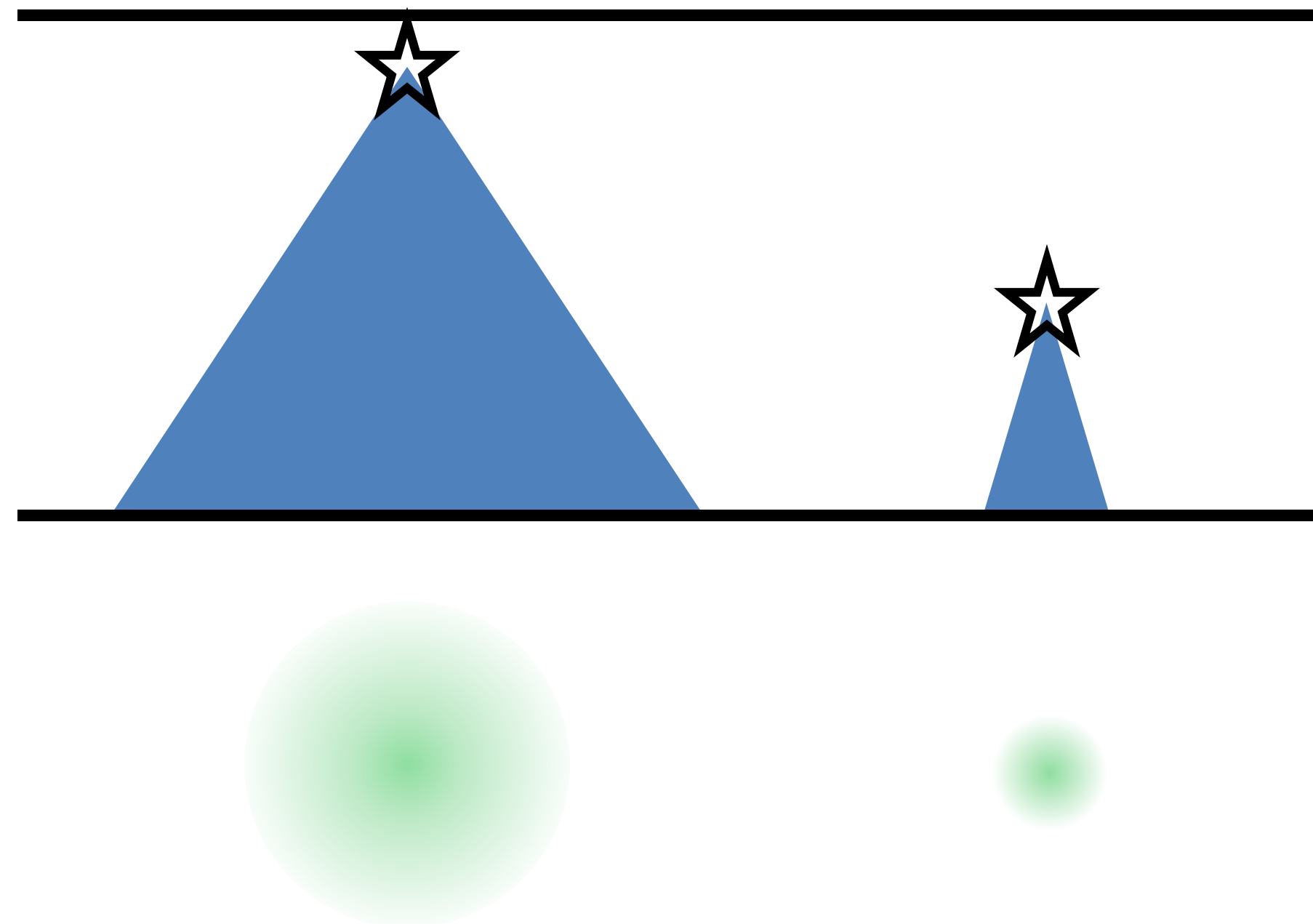
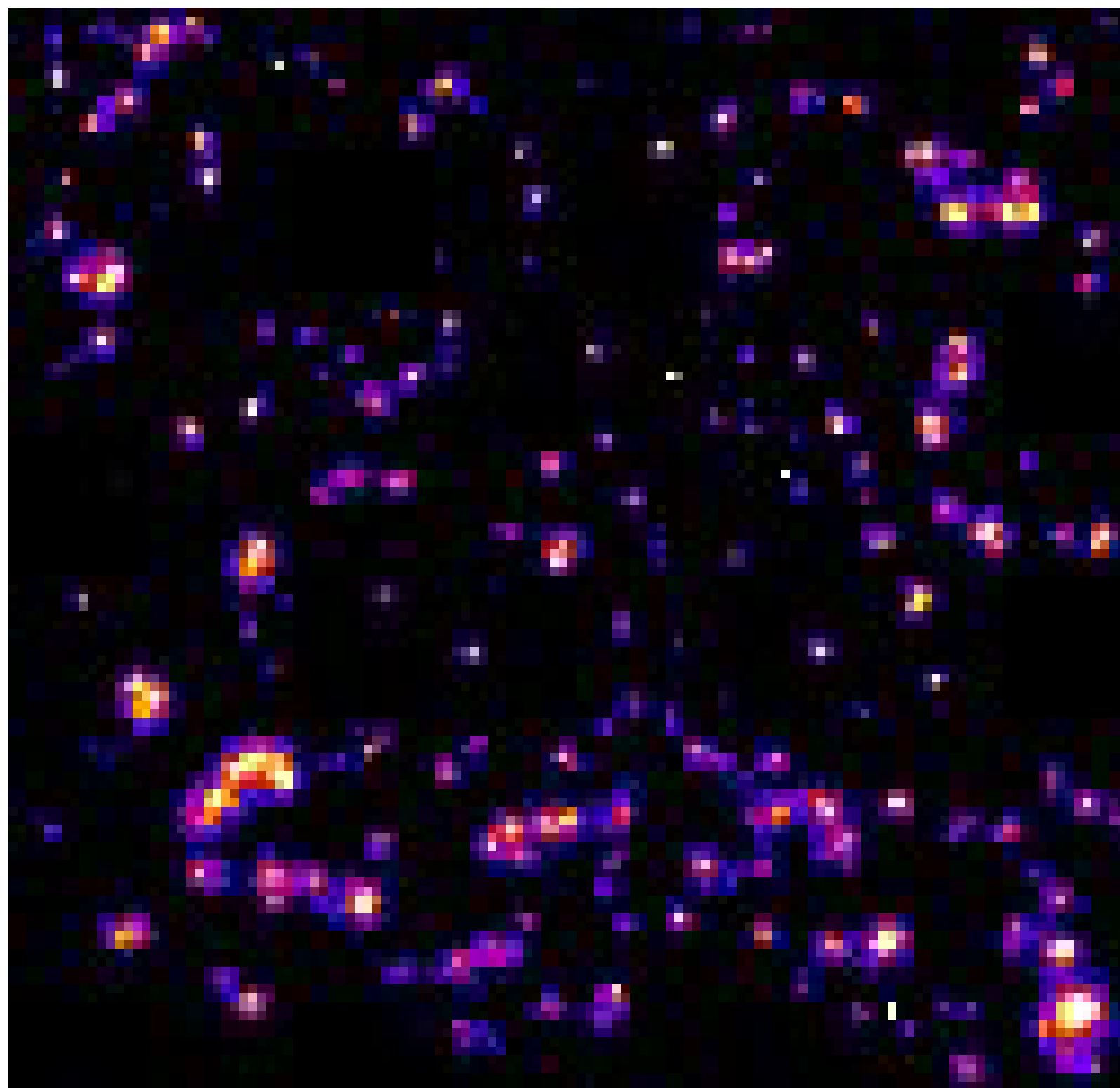
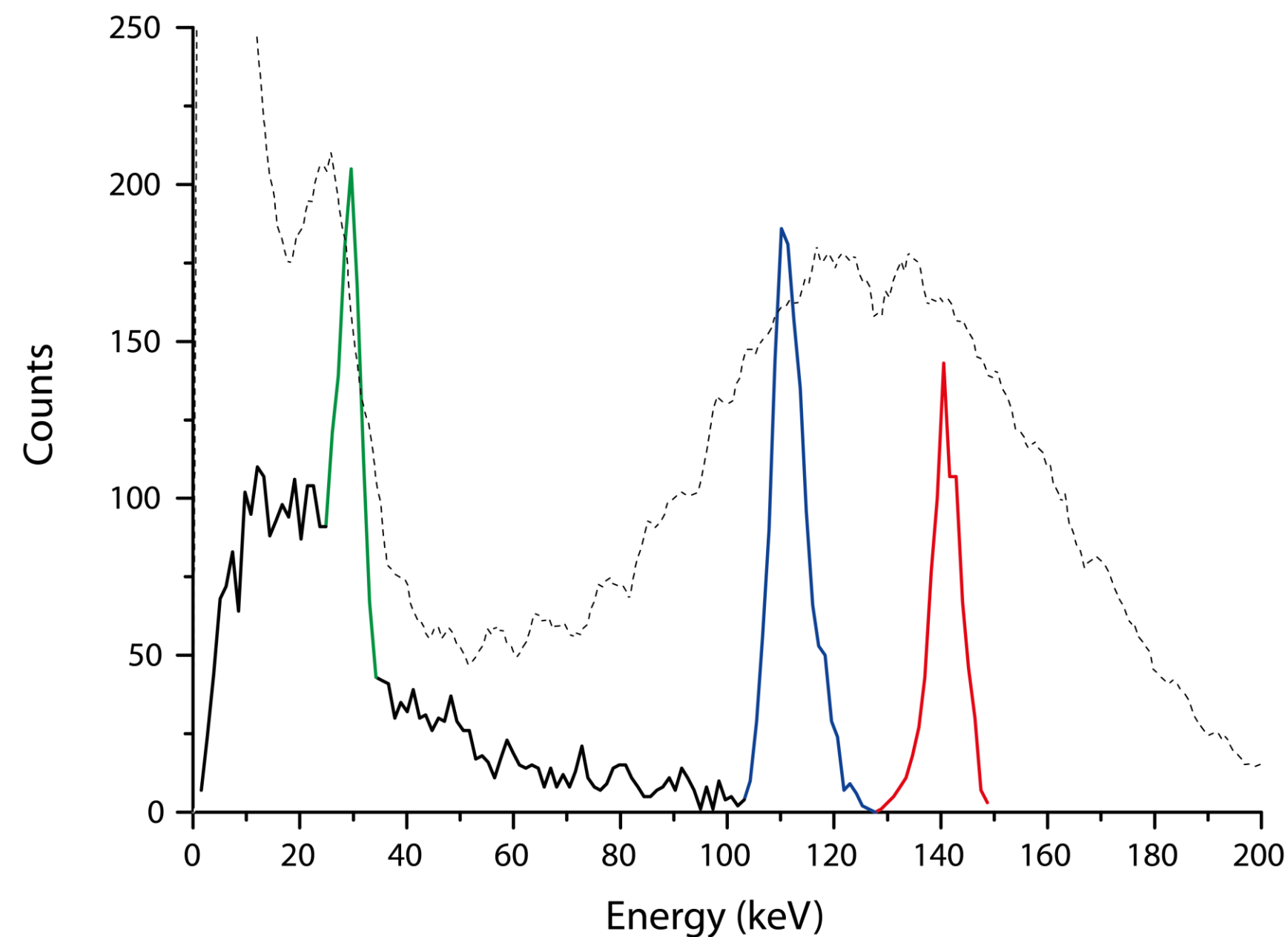
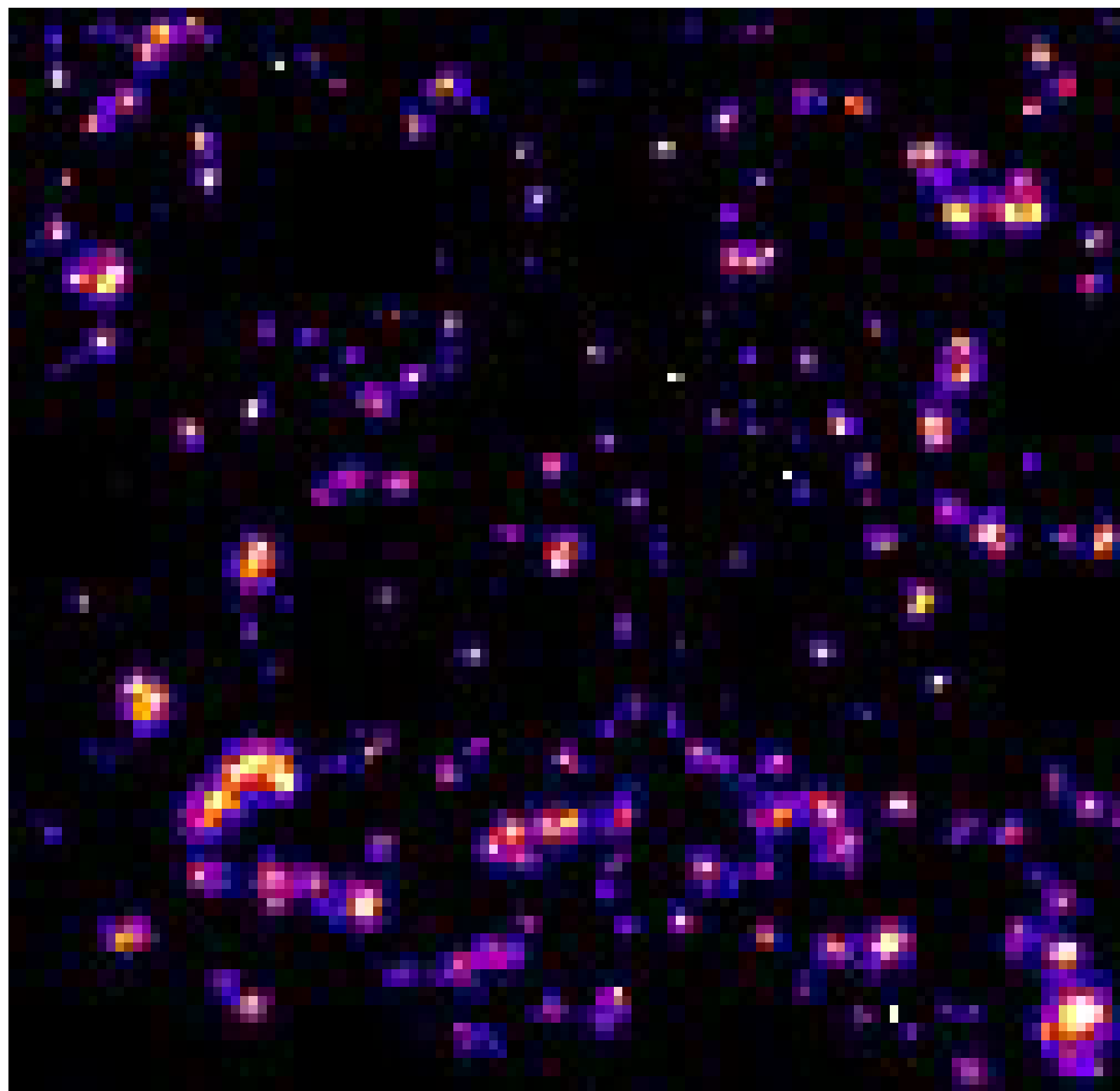
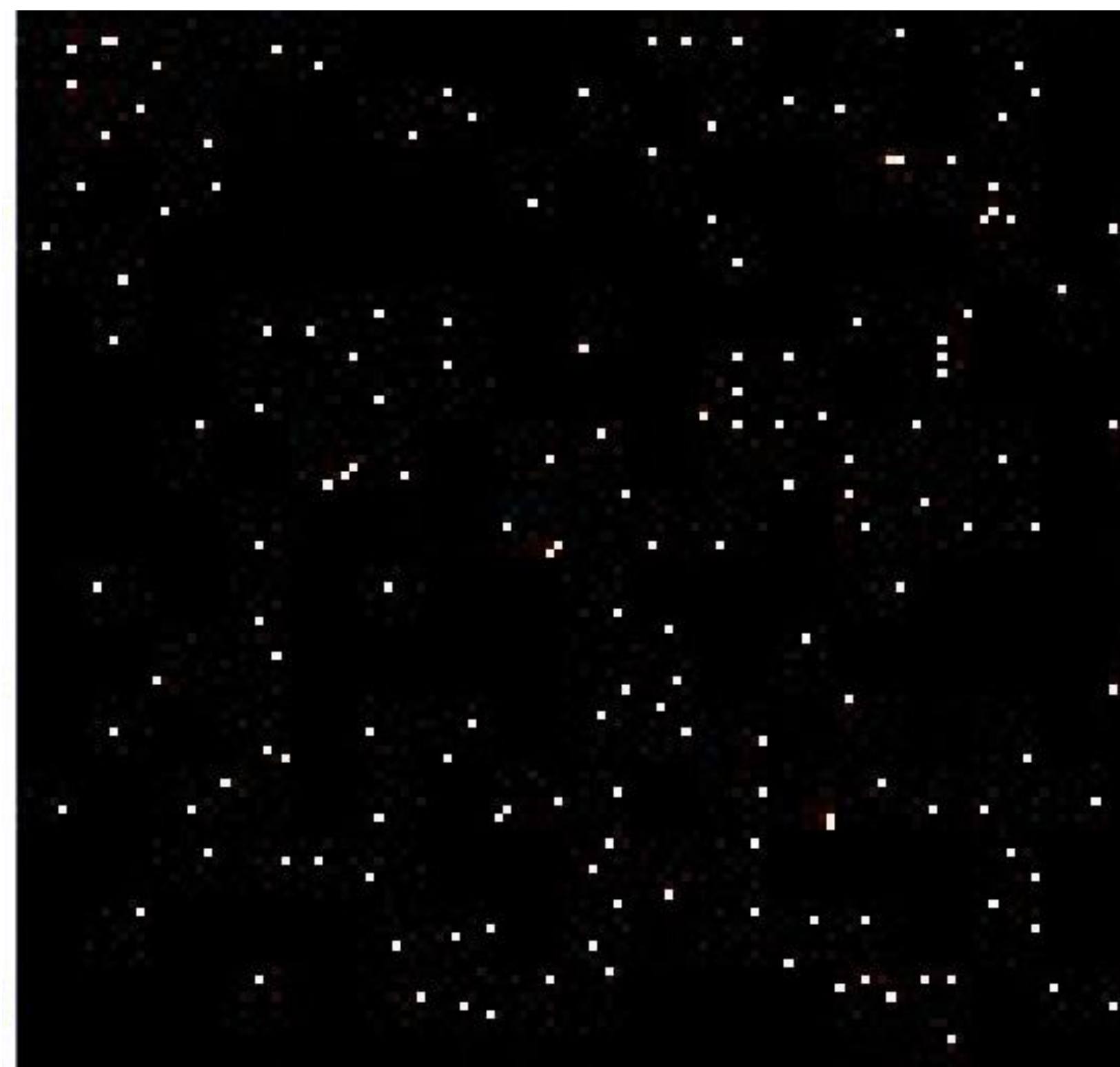
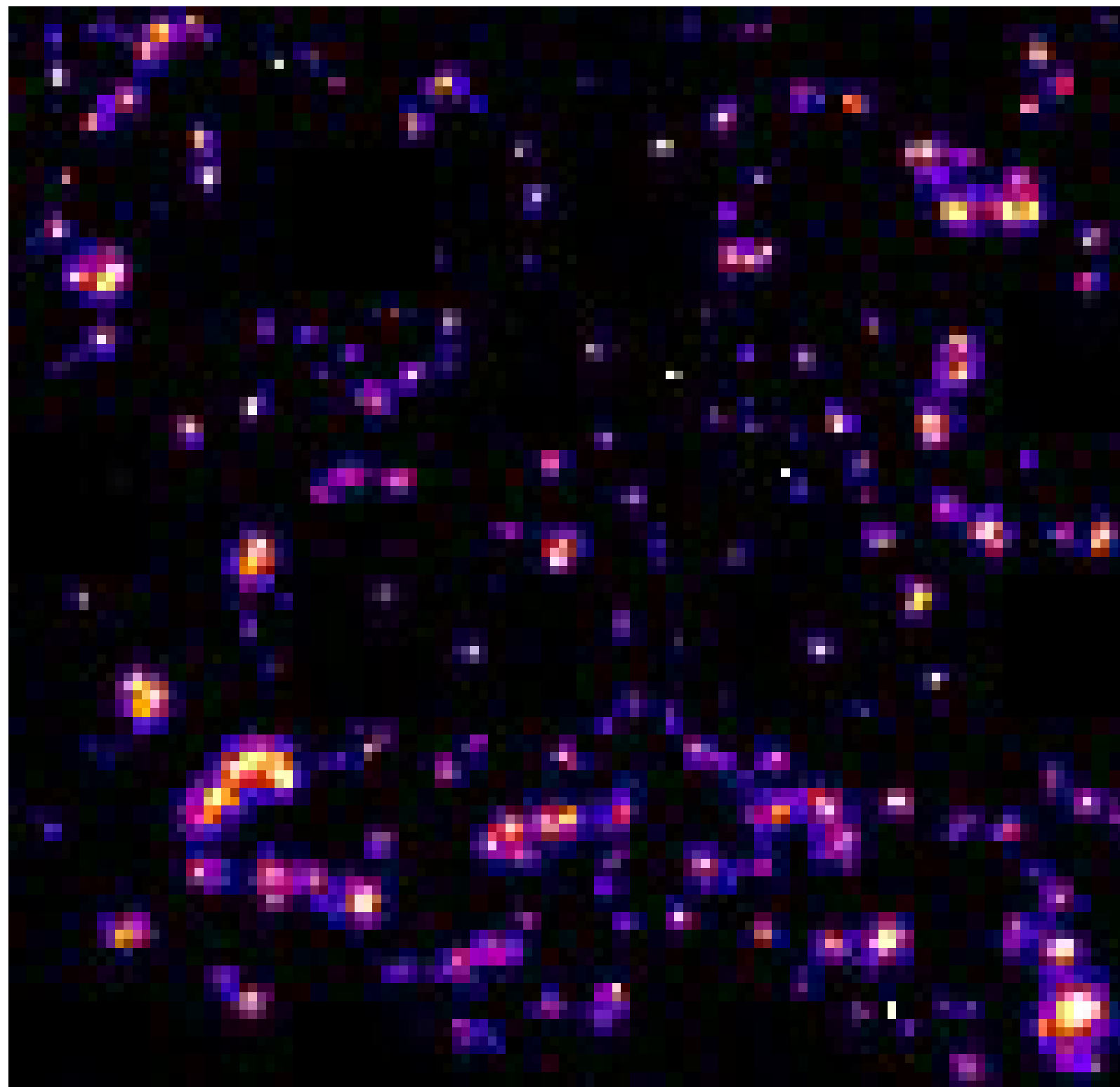


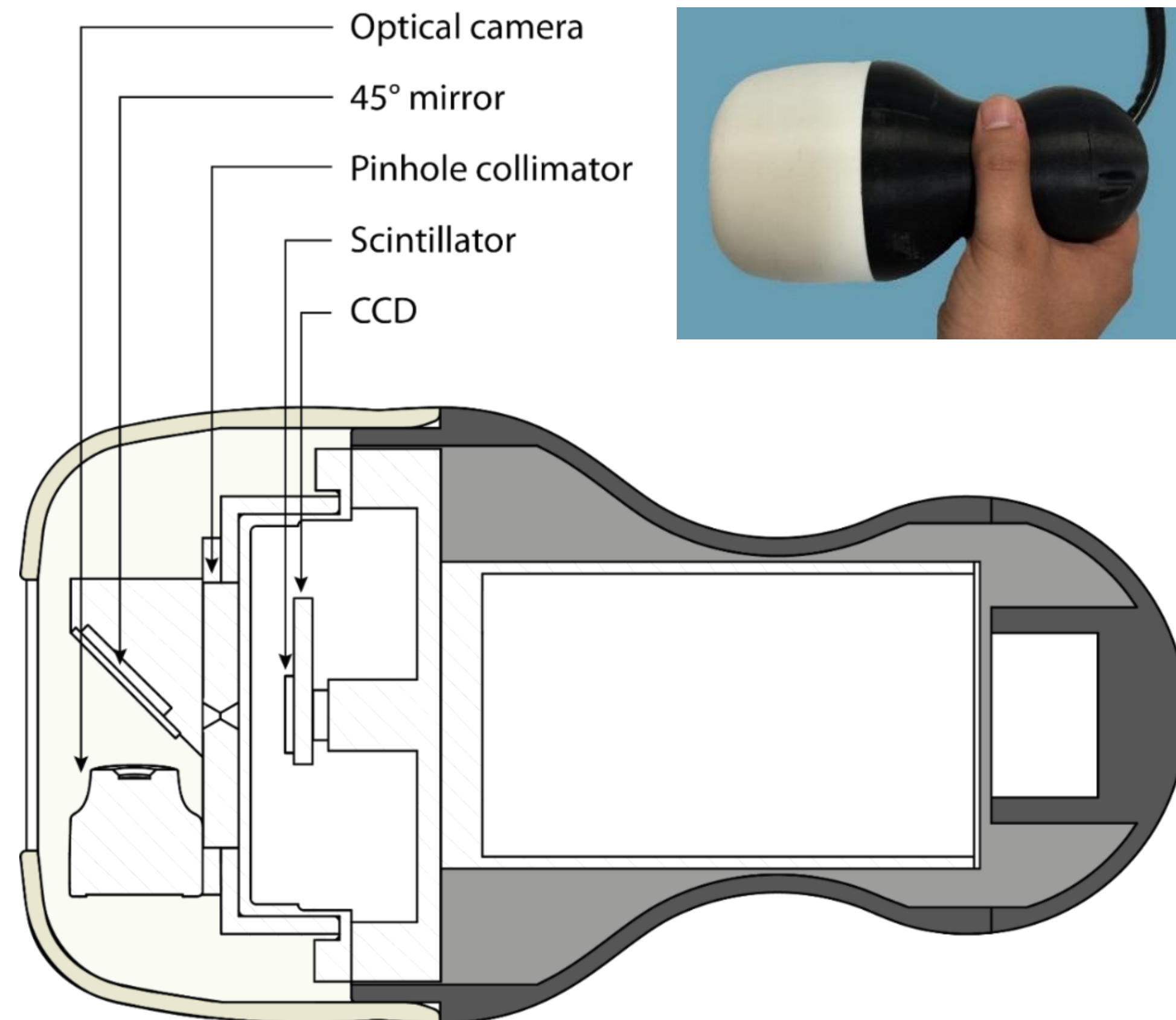
Image credit: *CsI - Scintacor*



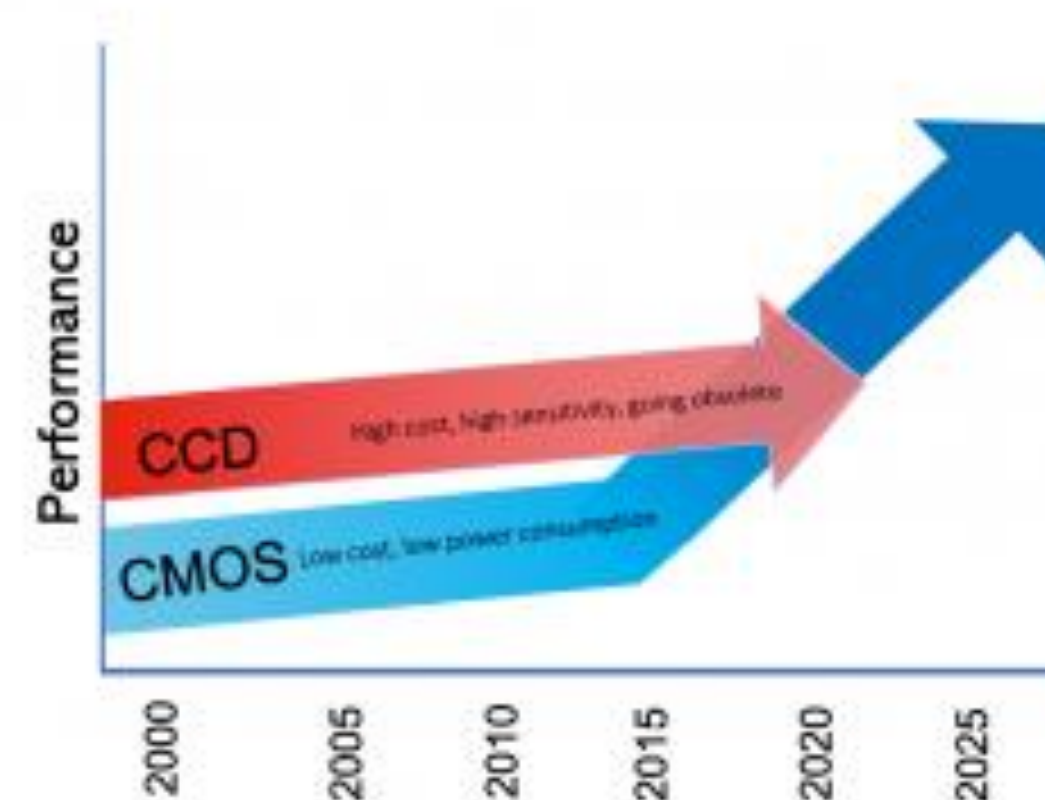
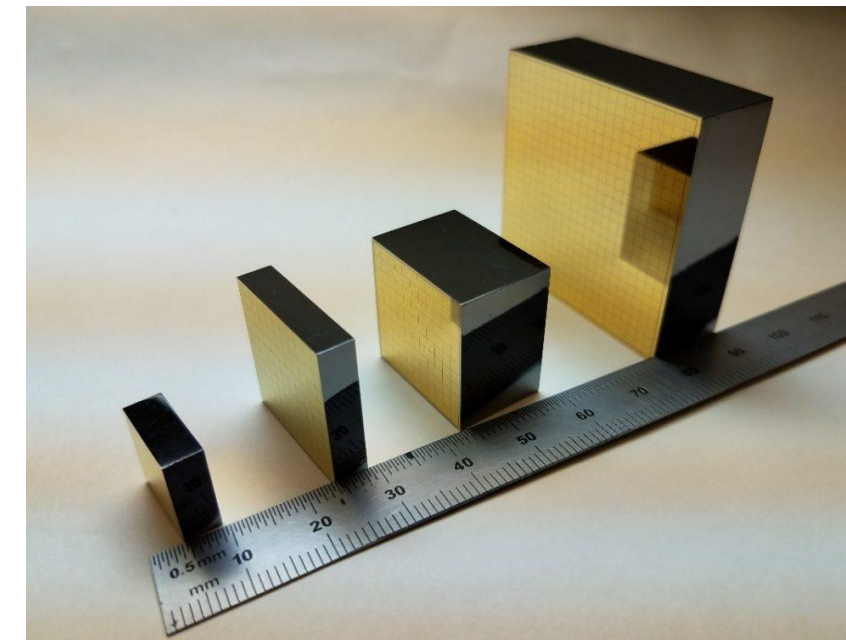


Comparison of simulated (solid) and experimental energy resolution for 600um thick CsI:TI scintillator detector.





- Rise of direct detectors
- CMOS improvements and cost reduction
- Machine learning and AI



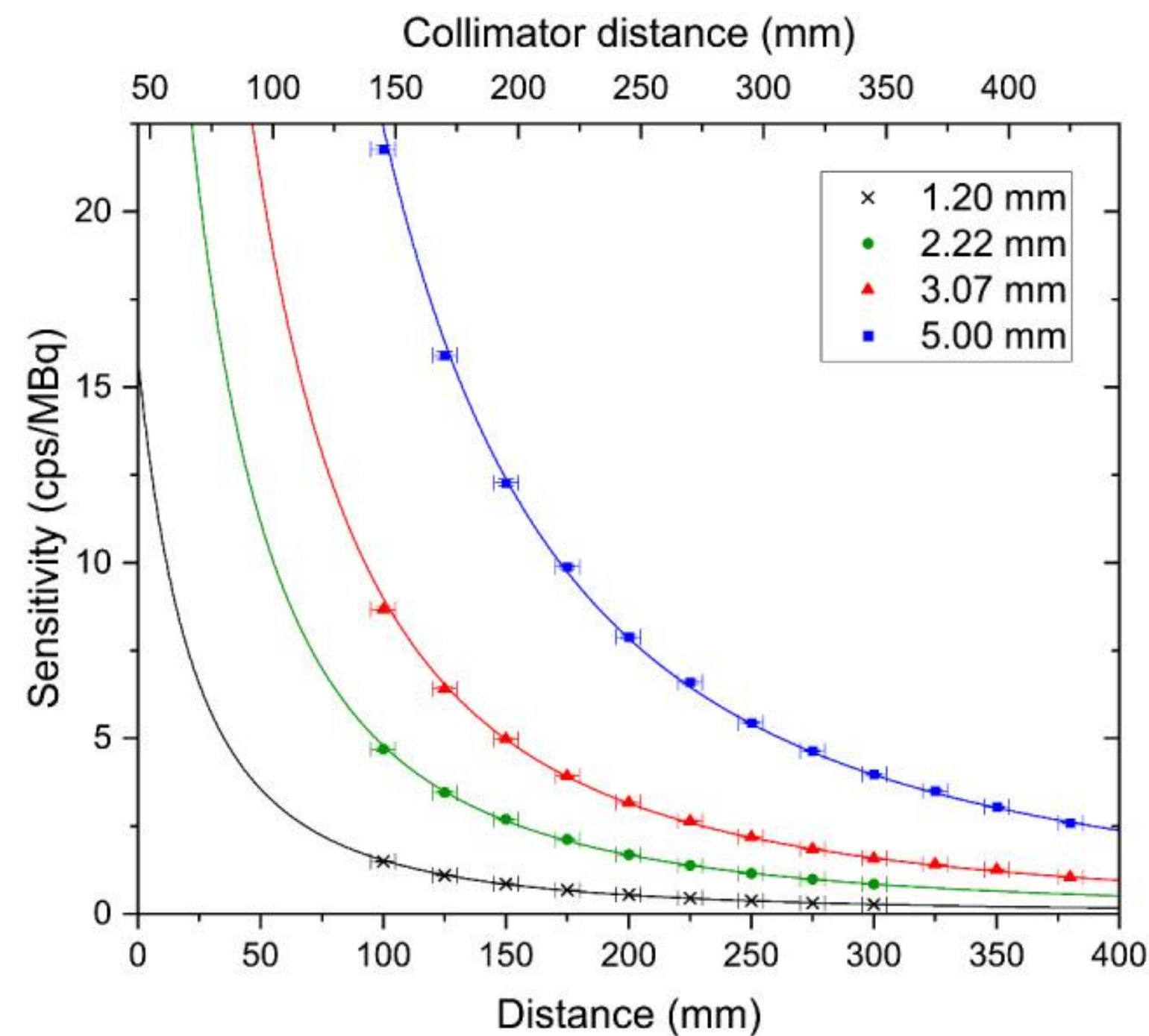
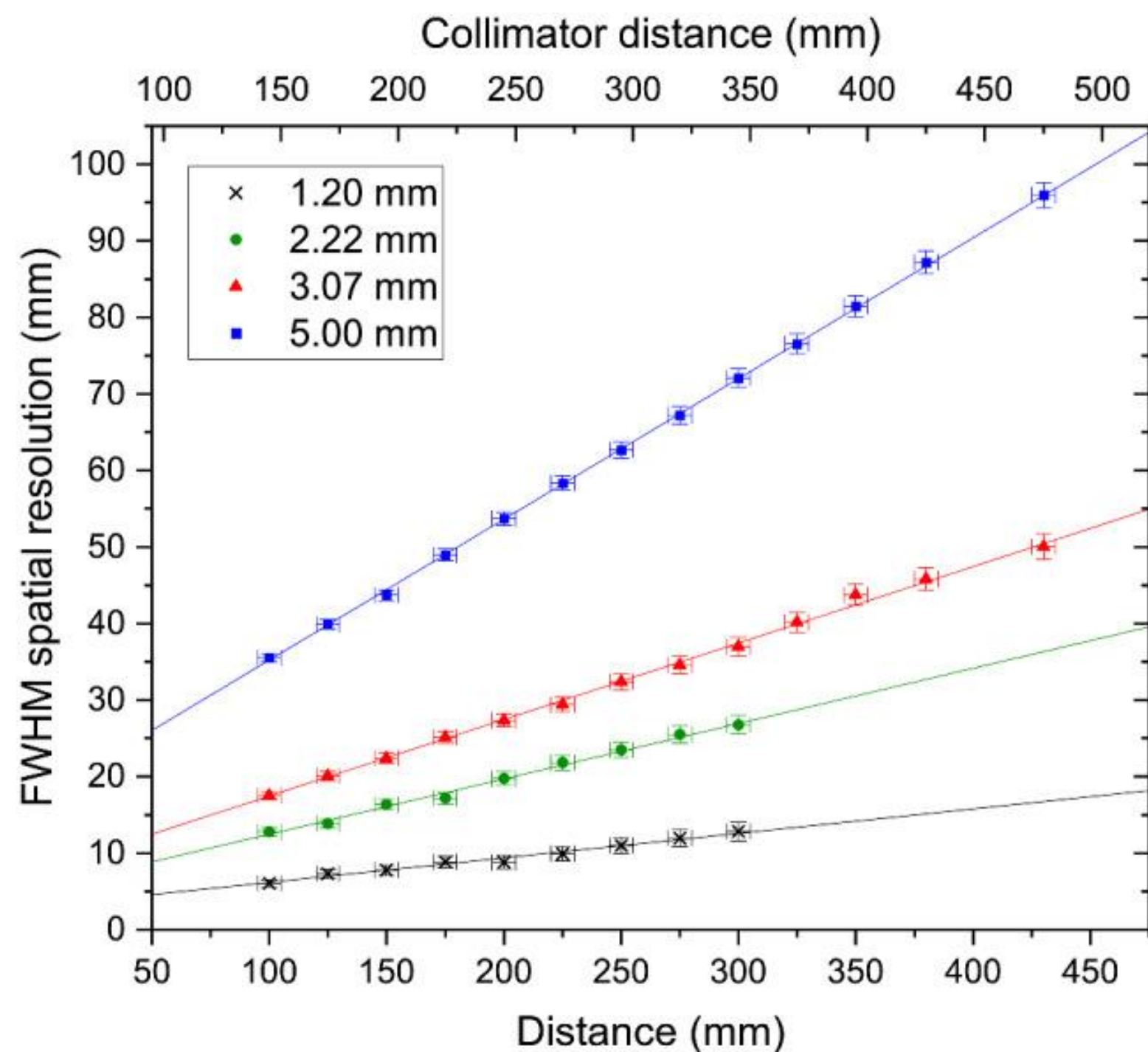
Journal of Instrumentation

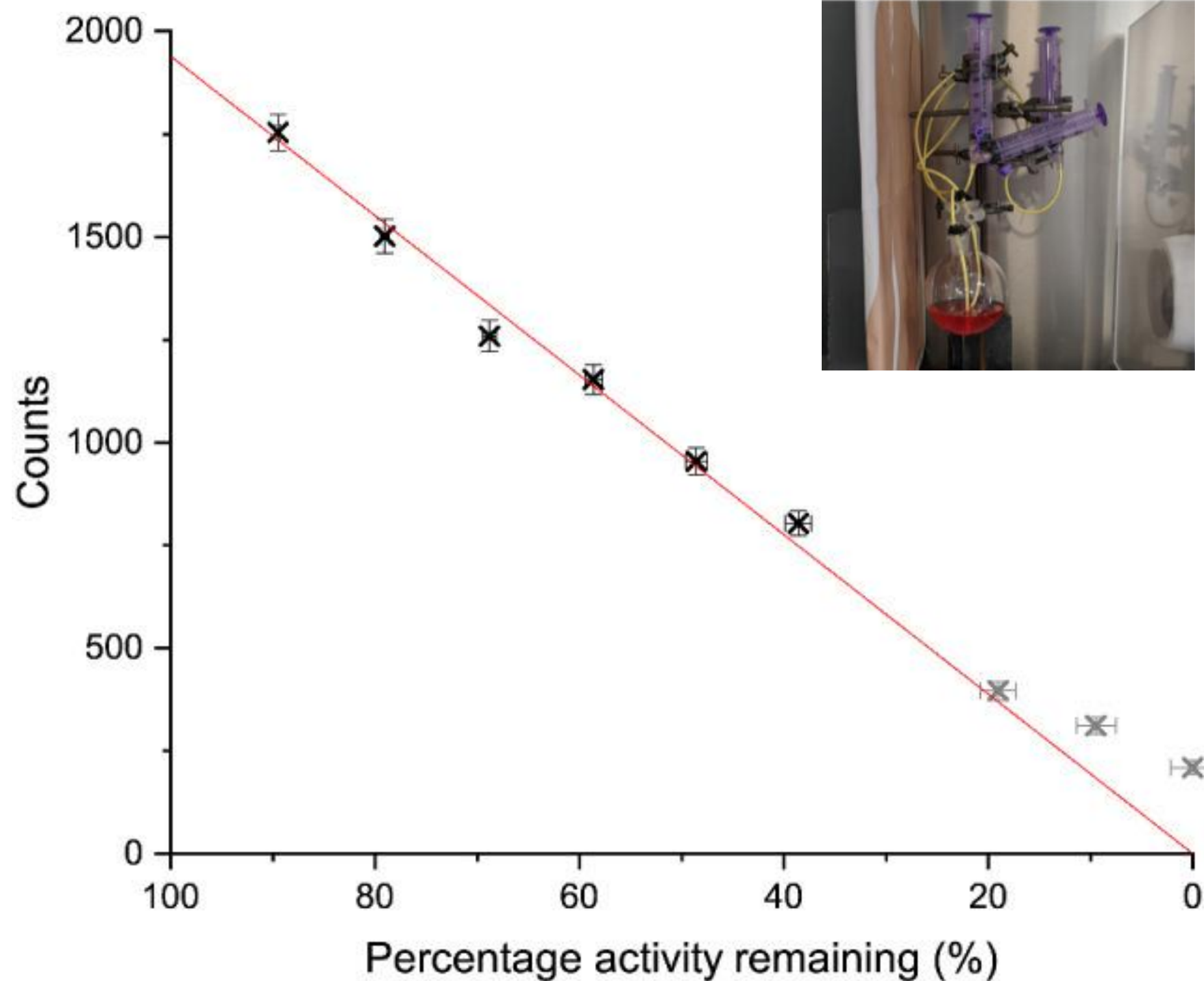
PAPER • OPEN ACCESS

Automatic detection of scintillation light splashes using conventional and deep learning methods

To cite this article: Y. Jiang *et al* 2022 *JINST* **17** P06021

Image credit: Top: Kromek Bottom: Teledyne Adimec..





Bugby et al. *EJNMMI Physics* (2024) 11:57
<https://doi.org/10.1186/s40658-024-00659-7>

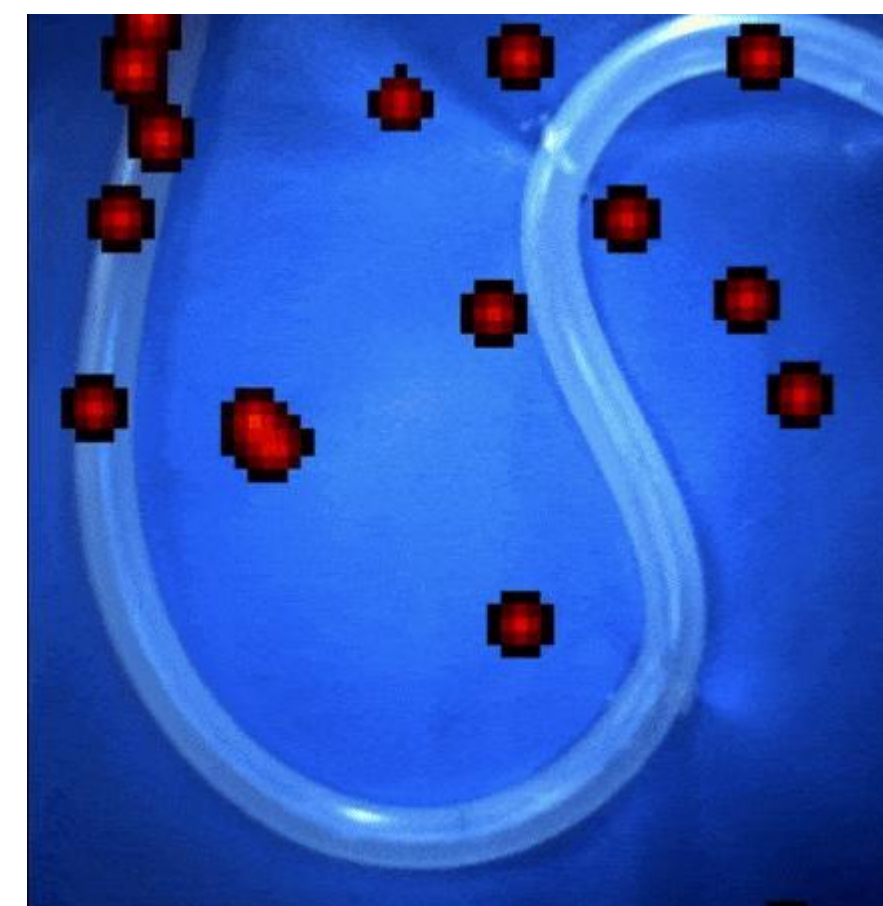
EJNMMI Physics

ORIGINAL RESEARCH

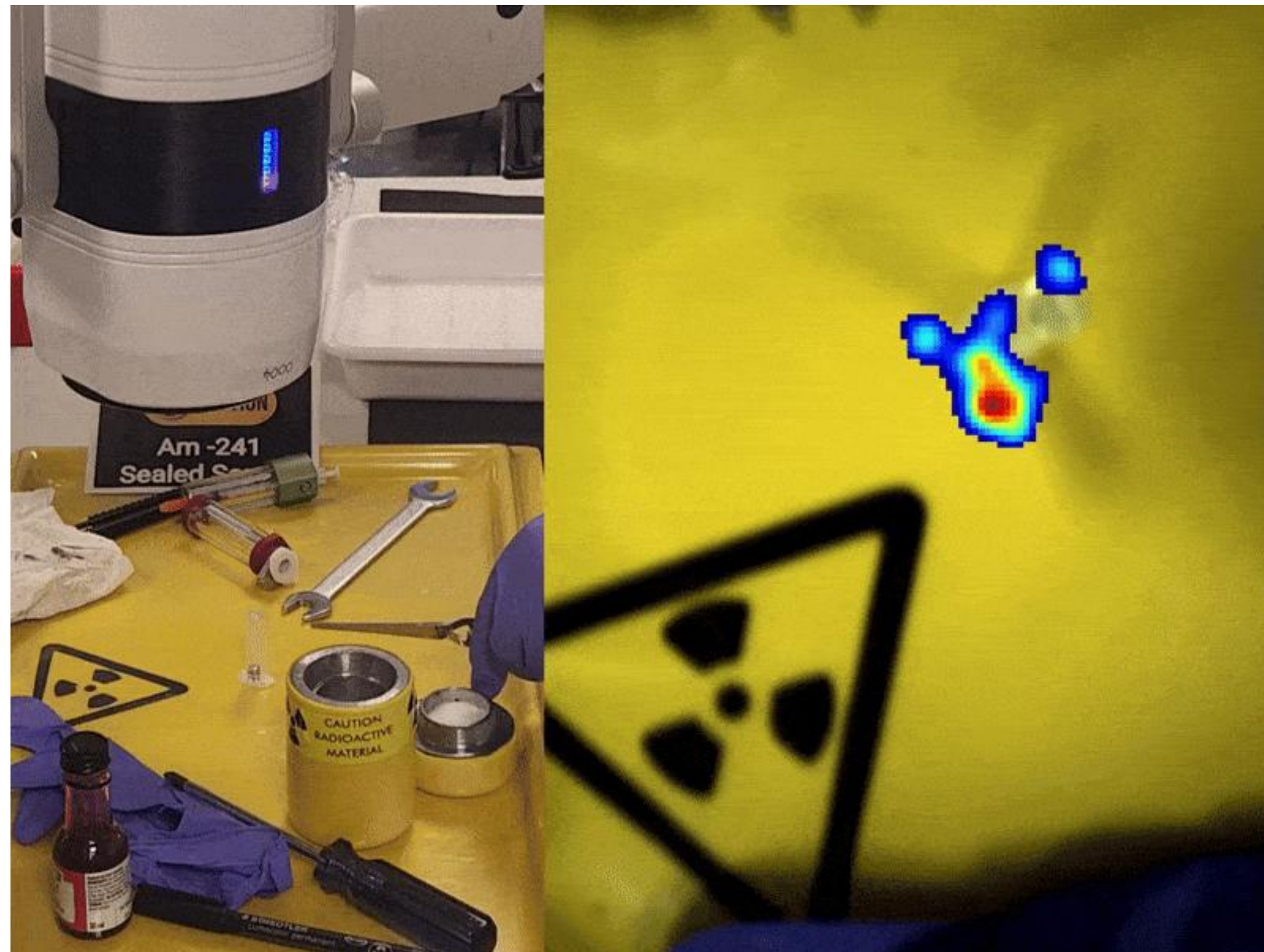
Open Access

Seracam: characterisation of a new small field of view hybrid gamma camera for nuclear medicine

Sarah L. Bugby^{1*}, Andrew L. Farnworth¹, William R. Brooks¹ and Alan C. Perkins²



- Appropriate spatial resolution and sensitivity
- Relative quantification
- Real time capability
- Deployed in the clinic and for decommissioning





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COST (European Cooperation in Science and Technology) is a funding agency for research and innovation networks. Our Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation.

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