

Hackathonino follow-up status

Christine Darve

IUPAP – WG14 Meeting M27

14 October 2026

Hackathonino@IPAC2026

aipf.web.cern.ch

More than 65 participants from 19 countries, and 9 challenges solved in 3 days !





Proof of concept established during IPAC2026 to strengthen synergies among students, research mentors, and companies, ensuring meaningful learning and engagement.





Activities are designed to build:

– **Technical problem-solving skills**

– **Teamwork & collaboration**

– **Communication & presentation skills**

– Insight into **accelerator design** and **professional design tools**

Website: [IUPAP-WG14 Hackathonino]

Article: *"From Light Sources to Innovation Ecosystems: The First IUPAP Hackathonino at IPAC2026", July 10, 2026*

IUPAP-WG14 Hackathonino

Broad topics include fault detection, beam optics, CANS, medical accelerators, infrastructure design, learning scenarios, and quantum computing

A	SE_ESS	Accelerator Beam Performance and First-fault Analysis
B	**US_SNS**	**RF window failure detection**
C	SA_UJ	Introduction to LLM for Topic Modelling
D	SA_UJ	Radiation Therapy Treatment Plan for cancer
E	**MAXIV**	**Develop an educational idea to introduce students to accelerator simulations**
F	**DE_FZJ**	**Decision-Making for a Compact Neutron Source (CANS) Upgrade Strategy**
G	US_MIT	Quantum Computing for Particle detection simulation
H	SE_ESS	Integrated Design Study for ESS Acc. Maintenance and Repair Facility
I	SE_ESS	AI-Driven Beam Dynamics Optimisation for High-Intensity Proton Linacs

Links: **Hackathonino Challenges List (link HERE)**

Students Presentations (protected)

Indico page (with recordings)

The 3 winning teams!

1st Prize : Challenge E – Develop an educational idea to introduce students to accelerator simulations



by Sverker Werin & Francesca Curbis, MAXIV

Maria Ünal, SOLARIS National Synchrotron Radiation Centre, PL
Helena Alamprese, Michigan State University, US
Hiiro Moriyama, University of Oxford, UK
Laury Batista, Paris Saclay University, CEA, FR
Weibo Hu, University of Science and Technology, CN
Wiktoria Wiatrowska, SOLARIS, PL

2nd Prize : Challenge B – RF window failure detection



by John Moss, Charles Peters, Sung-Woo Lee, SNS

Axel Perez Ruiz, Université Paris-Saclay, CNRS/IN2P3, IJCLab, Orsay, FR
Dinghui Su, Shanghai Institute of Applied Physics, Shanghai, CN
Johan Lundquist, MAX IV/Lund University, Lund, SE
Joel Valerian, University of Melbourne, AU

3rd Prize : Challenge F Decision-Making for a Compact Neutron Source (CANS) Upgrade Strategy



by Mina Akhyani (FZJ)

Jordan Byrne,
Aras Amini,
Oliver Betteridge,
Filip Peczek

University of Manchester

Winning team on Education : SILMARIL !

SILMARIL (Website | LinkedIn)

Hiiro Moriyama[1*], Maria Ünal[2], Wiktoria Wiatrowska[2], Helena Alamprese[3], Laury Batista[5]

[1] University of Oxford, UK
[2] SOLARIS National Synchrotron Radiation Centre, PL
[3] Michigan State University, US
[4] Universit´e Paris-Saclay, CEA, FR

*Correspondence e-mail: hiiro.moriyama@materials.ox.ac.uk

Possible Project Summary:

IOP Public Engagement Grant Scheme ➔

“Particle accelerators are widely used in medicine, industry, and research, yet high school and university students rarely encounter them due to low awareness and limited facility access. SILMARIL addresses this by bringing accelerators into classrooms through interactive simulations and 3D visualizations, inspired by Sverker Werin’s use of accelerator toolbox, making advanced accelerator physics accessible and free worldwide. Having developed a cloud-hosted platform and now building downloadable applications, the team has tailored SILMARIL for high school students in Kenya, a professor at MAX IV in Sweden, and an assistant professor at An-Najah University in Palestine”.





SILMARIL & Van de Graff generator Contest at ASP2026

Lecture "Real Physics: Particle Accelerators ", & "Cases Studies" presented in 4 high-schools (>2200 learners!), Outreach Program ASP2026, 13-14-15 and 16 July, 2026

Course for ASP2026: Particle accelerators

Laury Batista: laury.batista@universite-paris-saclay.fr

July 2026

Install the "Kahoot!" app (or go to kahoot.it on your browser) before class begins so that you're ready to participate.

Particle accelerators are currently used at several Kenyan hospitals in cities like Mobassa [1] and Nairobi [2, 3, 4].

1 Particle accelerators are already in Kenya

According to [5], Kenya recorded around 44,700 new cancer cases in 2026 and 32,000 deaths so far. In Kenya, there are linear accelerators installed in hospitals to treat cancer patients. Particle accelerators use high-energy particle beams to destroy cancer cells with precision, while sparing healthy tissue around the tumor.

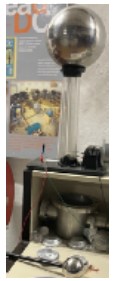
2 How do particle accelerators work?

The Lorentz force is the force experienced by a particle of charge q moving at a velocity v in an electromagnetic field. It is expressed in SI units as

$$\mathbf{F} = q(\mathbf{E} + \mathbf{v} \times \mathbf{B}) \quad (1)$$

2.1 Experiment: The Van de Graaff Generator

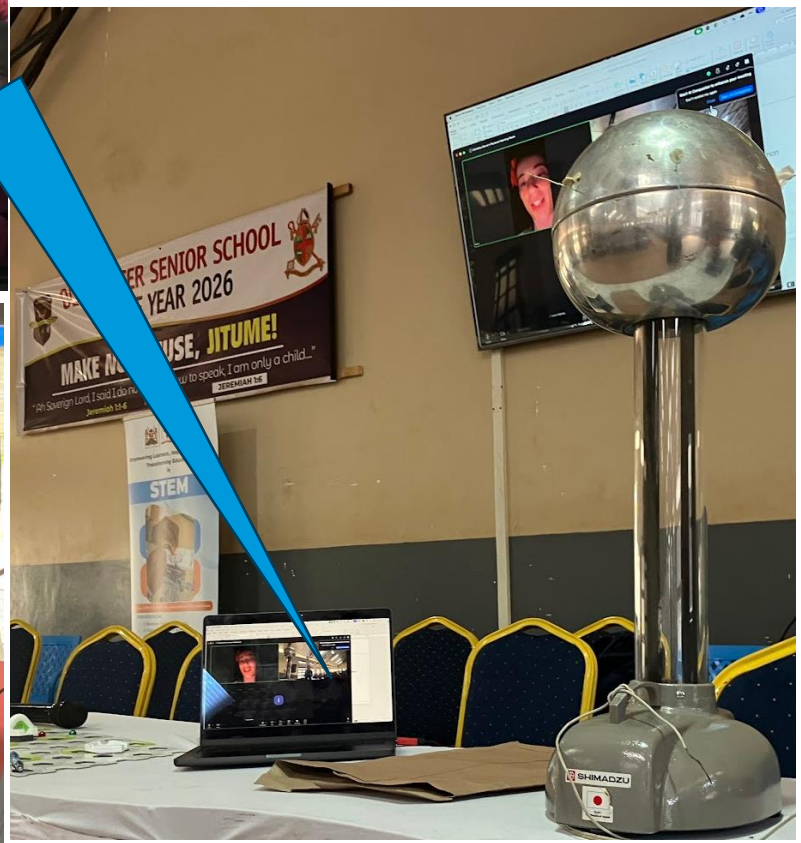
Mini contest: draw a graph of how the Van der Graaff generator works and send it to laury.batista@universite-paris-saclay.fr within 3 days. The winner will be included in the course handout for future years.



Access entire file Here





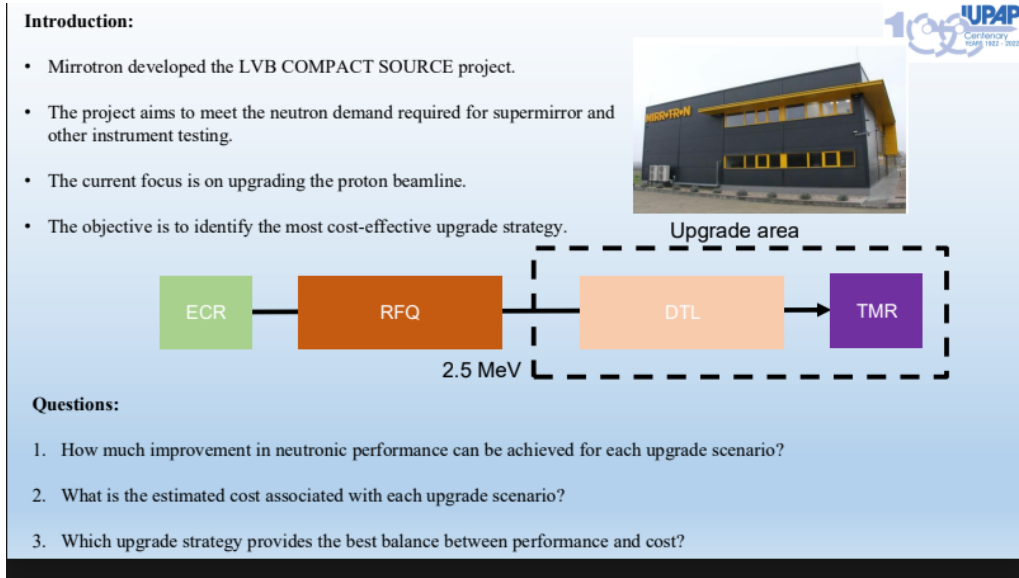


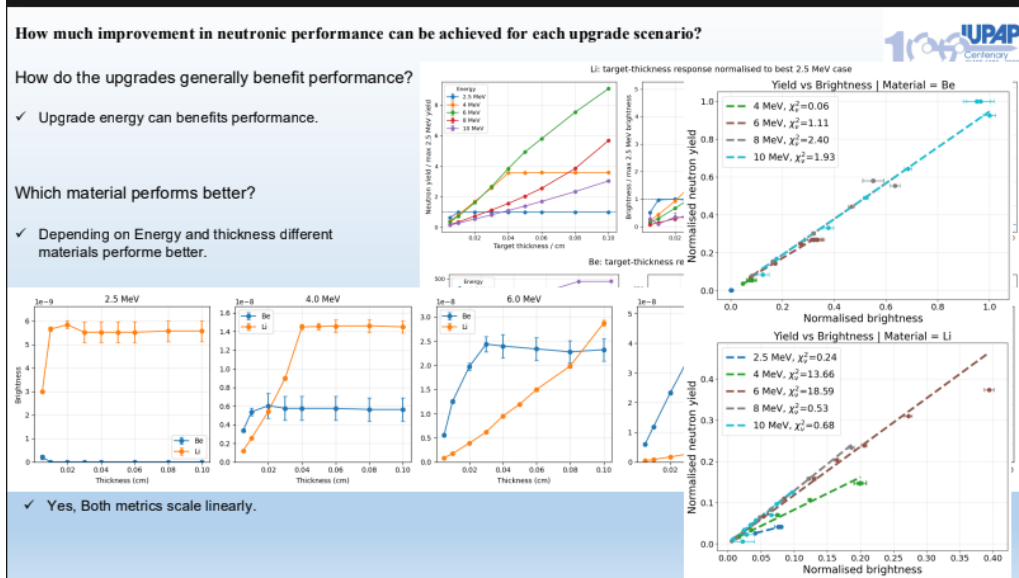
Winning team on CANS !

[F – Decision-Making for a Compact Neutron Source (CANS) Upgrade Strategy](#) by DE_FZJ

[Challenge F – Presentation](#)







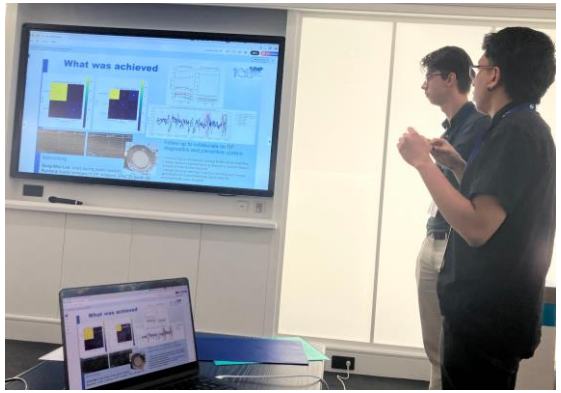
Any suggestions and/or contacts ?

Winning team on failure detection !

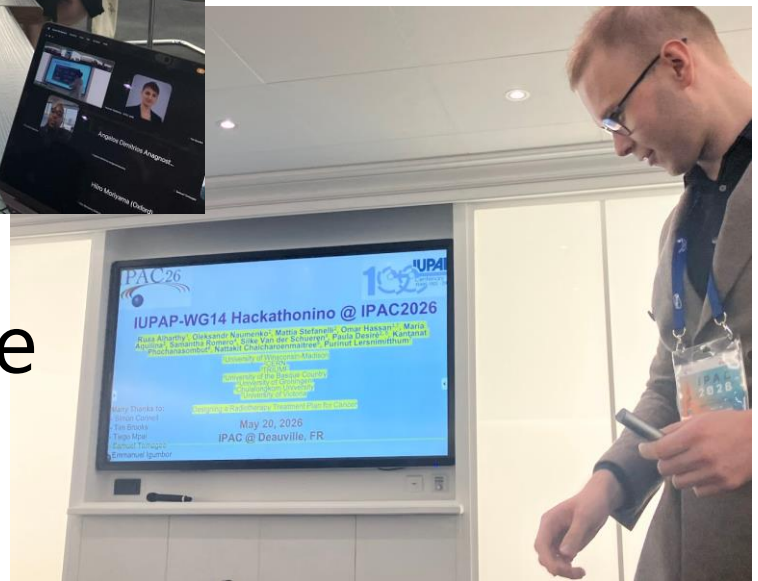
To be developped between ESS & SNS

[B – RF window failure detection](#) by US_SNS

[Challenge B – Presentation](#)







And much more examples …

