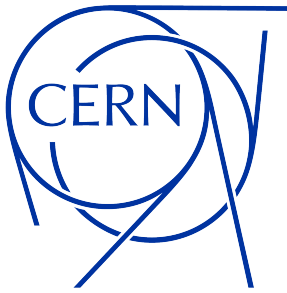


Report of the Early Career Researchers Committee

Lorenzo Pezzotti

Geant4 Collaboration Meeting
Hokkaido University, 25-29 September 2023



“Have an Early Career Researchers committee with a representative in the Steering Board.

The SB welcomes this initiative and recommends this committee to be formed.

It considers that it must not manage it but makes the following remarks:

- For what concerns representative at SB meetings, the SB suggests to have a rotation of representative.
- The SB warns about having this committee to be as inclusive as possible, taking care of not having a "CERN centric" view : for many young members, their situation is quite different than at CERN, being the only young member in their group because of the modest size of the group.”

Minutes of SB meeting held on 30/09/2022

ECRC timeline

- ◆ The Spokesperson gives to L. Pezzotti, J. Hahnfeld and A. Zaborowska the mandate to form the Early Career Researchers Committee (ECRC)
- ◆ A kick-off meeting takes place
The basic rules of the committee are set (see next slide)
- ◆ The 2023 ECRC members are identified on the basis of the Geant4 census
 - ♣ 41 researchers are found eligible
($\simeq 28\%$ of the Collaboration members)
- ◆ The first ECRC Chair election elects
 - ♣ Lorenzo Pezzotti and Carlo Mancini Terracciano as the 2023 Chair and Deputy, respectively
- ◆ So far we joined the SB meetings on March 22nd and June 28th

November, 2022



December, 2022



January, 2023



March, 2023

The ECRC rules

Few rules we are following (not written in stone, may change in future):

- ◆ ECRC members are selected every year using the G4 census information, they are
 - ❖ PhD Students, researchers who joined the Collaboration less than two years before, or obtained their last degree less than ten years ago
- ◆ ECRC members are added to the egroup geant4-ecrc@cern.ch (members can self-unsubscribe anytime)
- ◆ ECRC meetings are open and available at [INDICO→Geant4→ECRC](#)
- ◆ Every year, after the census, the ECRC elects the chairperson who is also the representative at the SB meetings
 - ❖ Candidates for the chair position nominate a deputy who replaces the chairperson in any capacity in case of unavailability

Proposals: Geant Induction Day

- ◆ (So far) New G4 members education on the life of the collaboration is left to them or at best to the supervisor
 - ❖ Other Collaborations provide Induction Day(s) meeting specifically targeting newcomers
 - ❖ For instance, ATLAS holds Induction Days every 3 months ([ATLAS-ID-AGENDAS](#))
 - ❖ Likely, for Geant4 a **single presentation per year to new members** is enough
 - ❖ Great Geant4 Courses exist already, however they do not explain much about internal life of the collaboration

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 - ❖ Great Geant4 Courses exist already, however they do not explain much about **internal life** of the collaboration
- ◆ Newcomers questions to be addressed at Induction Day:
 - ❖ *What is driving the sw R&D (new tools, new compilers, ...)? What is driving the physics research (new models, new tunings, ...)?*
 - ❖ Equivalent of the HEP-Experiments Induction Days question *what is driving the experiment upgrade(s)?*

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- ◆ Newcomers questions to be addressed at Induction Day:
 - ❖ On the **Geant4 contributing rules and possibilities**
 - ❖ Best practices: git usage (clang-format, C++ minimal version), CI testing
 - ❖ *What other contributing areas exist apart from geant4-dev repository?*
Physics and sw validation, Geant4 forum, courses, ...

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- ◆ Newcomers questions to be addressed at Induction Day:
 - ❖ On the **Geant4 publication/service-task policy**
 - ❖ *When am I supposed to forward my paper to the publication board?*
 - ❖ *If I contribute to the Geant4 repository, will I be included in the future Geant4 publications?*
 - ❖ *Am I supposed to work on service tasks? If so, how is it taken into account by the Collaboration?*

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 - ❖ **On reporting results**
 - ❖ *How do I share new physics results? Is reporting to WGs enough?*
Are we sure all new members of the Collaboration know there is a long term validation project?
 - ❖ *How do I contribute to geant-val?*

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- ◆ Newcomers questions to be addressed at Induction Day:
 - ❖ **On what Geant4 is not supposed to do**
 - ❖ Often I receive questions from new users/members like *how do I simulate the Higgs boson in Geant4?*
how can I simulate plasma weak field acceleration in Geant4?
 - ❖ Equivalent to the HEP lesson on *what not to do in the experiment*,
e.g. *do not start a new physics analysis on your own!*

Proposals: Geant4 Internal Seminars

- ◆ Having a series of internal seminars for knowledge transfer is likely the most useful way to propagate knowledge in critical areas
- ◆ Transfer should not only be *from senior to junior* but also *from junior to senior*
- ◆ The more technical seminars could be *the basis for the Technical Notes* we are looking for since a long time

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- ◆ List of **desired topics**, **from junior to senior**:
 - ❖ **Geant-val**: status, how to contribute and future plans
 - ❖ D. Konstantinov and I are available for this seminar on behalf of the Validation TF
 - ❖ Could be the starting point for regular meetings hold by the Validation Task Force
 - ❖ Review of **git** and **GitLab usage** (including CI and nightly testing) and the **CMake build system** (B. Morgan is available for this seminar)
 - ❖ **GPUs offloading** (an **introduction** was already given by J. Hahnfeld)
 - ❖ **Machine Learning** solutions in Geant4

} Available on demand,
let us know if interested

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- ◆ The more technical seminars could be the basis for the Technical Notes we are looking for since a long time
- ◆ List of desired topics, from senior to junior:
 - ❖ Advanced geometry features: geometry voxelization, and review of CAD-G4 interfaces
 - ❖ Hadronic physics modeling: *how does the Monte Carlo within the Monte Carlo works, how we go from complex physics models to code?*
 - ❖ Choosing a Physics List/Optimizing the simulation
(recently the HEP Software Foundation had a similar [review](#))
 - ❖ Geant4 usage in current Knowledge Transfer activities and outside academia

We are looking for volunteers

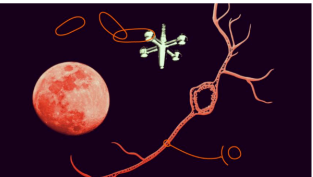
Proposals: Regular discussions on grants

- ◆ We would like to discuss with the Steering Board about [applications to granting schemes](#)
- ◆ Even if the outcome is negative, it is important to have a feedback from the SB about the Collaboration view on this topic
- ❖ *When more person power is needed, how do we try to get external contributions?*
2022 HL-LHC Software and Computing Review Panel Report: It is also crucial that the physics description of the detailed simulation continues to improve, and care should be taken in maintaining a sufficient core developer team with appropriate expertise
- ❖ *Are young member of the Collaboration aware of applications to grants related to Geant4?*

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- ◆ Few examples (European biased)

Doctoral Networks



Doctoral Networks call schedule

- The 2023 call for Doctoral Networks is now **open**.
- The call will close on **28 November 2023**.

[Call for MSCA Doctoral Networks 2023](#)
➔

Marie Skłodowska-Curie Actions Doctoral Networks

to implement doctoral programs by partnerships of organizations from different sectors across Europe and beyond to train highly skilled doctoral candidates

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Postdoctoral Fellowships



Postdoctoral Fellowship call schedule

- The 2023 call for Postdoctoral Fellowships is now **open**.
- The call will close on **13 September 2023**.

[Check the call for MSCA Postdoctoral Fellowships 2023](#)



Marie Skłodowska-Curie Actions Postdoctoral Fellowships

targets researchers holding a PhD who wish to carry out their research activities abroad, acquire new skills and develop their careers

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European Research Council
Established by the European Commission

ERC - Synergy Grant

Synergy Grant

ERC Synergy grants support projects carried out by a group of two to four individual researchers who can employ researchers of any nationality as team members

Last thoughts

- ◆ I (and many others) believe implementing the ECRC proposals would strengthen the Collaboration and be beneficial for the new generations
- ◆ Some considerations:
 - ❖ Report from young scientist fora at the LHC: *Early Career Scientists (ECSs) are scientists without a permanent contract and make up $\approx 50\%$ of all authors in each experiment at the LHC*
 - ❖ In the Geant4 case, the ratio is much smaller than 50%
 - ❖ Most young members join Geant4 on top of other Collaborations. Often their involvement with Geant4 is limited
 - ❖ The ECRC role is mostly to report on proposals, problems and future looking. Bringing to completion the ECRC ideas will be possible only in collaboration with senior members