

## Report on the activity of WG9 – Period June 2024- June2025

*Prepared by the chair Angela Bracco*

The activity carried out in this period was concentrated mainly on two issues: i) a continuous update of Report 41, a document which collects information on the laboratories around the world that are involved in nuclear research and ii) the organization of the annual general meeting (AGM). The latter took place in Daejeon (Korea) on Wednesday, 28th of May 2025.

The chair (Angela Bracco, Università degli Studi di Milano and INFN Milano), the secretary (Iris Dillmann, TRIUMF), the past chair (Robert Tribble, Texas A&M), and 14 WG9 members participated also in the open session of C12 held on the same day.

On 10-14 October 2024 the WG9 secretary Iris Dillmann participated in the *33rd IUPAP General Assembly* of Liaison Chairs and Commission Chairs that took place in Hainan, China. On that occasion the external evaluation of IUPAP was presented and discussed.

It was reported that charges to the *Working Groups* WG1, WG7, WG9, WG11, WG14, WG18 and WG21 were given. The charges followed the suggestions of the external evaluation on how the activities of the Working Groups should continue. This point was thoroughly discussed as described in the following section.

### IUPAP Report 41

The Report 41 (“A Worldwide Perspective of Research and Research Facilities in Nuclear Physics”) provides information on the ongoing activities and the perspectives of many research facilities focusing on Nuclear Science located around the world. The Report 41 gives a brief description of the nuclear facilities that have an acknowledged User Organization.

The Introduction to the Report outlines the key physics issues that have led to the nuclear science facilities existing or being planned:

- The nuclear physics as studied from its beginning; nuclear structure and nuclear reactions, the formation of the elements throughout the universe including the super-heavy elements.
- The structure of the nucleon consisting of quarks and gluons within the Standard Model.
- Fundamental symmetries leading to physics beyond the Standard Model and with the study of neutrino properties through neutrino-less double beta-decay and neutrino oscillations.
- Nuclear energy in the era of climate change and global warming.
- Applications of nuclear physics to the benefit of society, e.g. as in nuclear medicine.

The scientific secretary, with the help of the present and past chairs, was strongly involved in reshaping Report 41. The work to homogenize the style and type of content was recently completed together with the writing of an introduction. The updated version of the report was printed to be sent to the WG9 members and it is available in the WG9 webpage under <https://wg9.triumf.ca/report41.html>.

We are considering the addition of a few pages with summaries of the Long Range Plans of NuPECC involving several European countries and of the Long Range Plan of USA, after their publication.

We have also decided to add a chapter dealing with topics related to the societal impact of our facilities. The preparation of this new chapter is ongoing. Special emphasis is on the topic of quantum science and technology and/or in high power computing driving innovation in the fields of AI (Artificial Intelligence) and ML (Machine Learning). Also the activities related to the International Year of Quantum Science and Technology will be highlighted.

## **The 2025 Annual General Meeting (Daejeon (Korea) 28th of May 2025)**

The agenda of the 2025 annual meeting (<https://indico.triumf.ca/event/769/>) focused on the long range planning for nuclear science in the different areas in the world and on selected reports on major facilities under construction or starting operation.

### ***Long Range Planning : Organization Reports***

Long range plan reports were presented from the Asian Nuclear Physics Association ANPhA (by Byungsik Hong, <https://dnpkps.wixsite.com/home/anpha-asian-nuclear-physics-associa>), from NSAC (by Gail Dodge Old Dominion University, <https://nuclearsciencefuture.org>), and from NuPECC (by Marek Lewitowicz, GANIL, <https://www.nupecc.org>). The main mission of these committees and organizations is to strengthen collaboration, coordination and planning of research in Nuclear Physics in Asia, USA and in Europe, respectively. They are also responsible of preparing the strategic plannings in nuclear science. A report from ALAFNA, the Association of Latin American Nuclear Physics and Applications, was also given.

In the USA the latest Long Range Plan for Nuclear Science was released in October 2023. It provides a road map for advancing the nation's nuclear science research over the next decade. It highlights scientific opportunities for maintaining leadership in research and for training the workforce. The NuPECC Long Range Plan concerning the scientific strategy in Nuclear Physics in Europe was released at the end of 2024.

### ***Reports on major facilities under construction or starting operation.***

The status of the following facilities were presented and discussed in the AGM 2025

- RIKEN (Japan)
- Status of the construction of FAIR (Germany)
- FRIB (USA)
- Status of the construction of EIC (USA)

The presenters in their reports pointed out the importance of the international collaborations to increase the attractiveness from users of these open access facilities. WG9 is playing a role in this connection, providing the unique opportunity to discuss scientific plans of facilities at worldwide level. This is indeed the main mission of this working group of IUPAP.

The agenda of this meeting and the links to the presentation files are available at:

<https://indico.triumf.ca/event/769/overview>

It was decided to have next year in addition to the Annual General Meeting also a Symposium and an “in camera” meeting of the funding agencies. These meetings will be held in Rome in April 2026.



*Members of IUPAP WG9 and C12 during the 2025 Meeting hosted in Daejeon in South Korea.*

## **WG9 planning for the next years**

A long discussion also together with the chair and the secretary of C12 took place on the topic “Planning for next years”.

We have recalled that WG9 was created to facilitate an international cooperation within the nuclear physics community following the recommendations of the various committees that preceded it. The main objectives of WG9, still valid and supported by the members are:

- To promote international cooperation in the broadest sense with the construction and exploitation of the large nuclear physics facilities - those which are intended for use by a worldwide nuclear physics community.
- To organize meetings on a regular basis, which are open to all wishing to attend, for the exchange of information on future plans for nuclear physics facilities, including also multi-disciplinary facilities or facilities intended to more regional use.
- To stimulate the organization of workshops and/or symposia to discuss the ongoing and future programs and development plans of nuclear physics and the need for facilities for the various subfields: high energy heavy-ion beam facilities, radioactive-ion beam facilities, multipurpose hadron beam facilities, high energy electron beam facilities and research in various applications of high societal impacts as e.g. those in the medical area.

Keeping these objectives in mind we have decided to prepare a document for the general assembly in 2027 that complies also with what will be suggested and requested by the IUPAP management.