

# **INTDS** Newsletter



New plunger (left) with a carbon target on gold backing (right). Center for Accelerator Target Science, Argonne National Laboratory, Lemont, Illinois, United States.

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Dear Members of the INTDS community,

Welcome to the latest issue of our newsletter! In this edition's "Target Laboratories of the World," Claus, John, and Connor take us on a tour of the Center for Accelerator Target Science at Argonne National Laboratory, USA. They are thrilled to showcase their new plunger targets, which have earned the honor of being featured on the title page.

We are also excited to share updates on the nuclear target activities within the EURO-LABS program, along with the report on the report on the "Ion Sources and Targets" workshop held at GANIL as well as the report on the SANDA–workshop in the Joint Research Centre of Geel.

In the "News of the INTDS Board" section, we have a summary of the virtual meetings of the INTDS Executive Board, including membership and treasurer's reports, as well as the updated by-laws. In addition, you can meet the candidates for this year's Board positions.

You will also get to know Zeynep Talip, the new group leader of the Isotope and Target Chemistry Group at the Laboratory of Radiochemistry at the Paul Scherrer Institute in Switzerland. We additionally celebrate the career and retirement of her predecessor, Dorothea Schumann, who is now enjoying her well-earned retirement.

Don't miss the third announcement of the INTDS conference. If you haven't renewed your membership yet, now's a great time to do it! Lastly, we're happy to include an advertisement from our sustaining member, Arizona Carbon Foil Co., Inc. (dba ACF-Metals).

We need your help to keep our newsletter interesting and informative! Please send your contributions, ideas, advertisements, or anything you'd like to share with the INTDS members to INTDS-Newsletter@gsi.de. Don't be shy—share some of your tips and tricks with your fellow target makers!

Best wishes, Bettina Lommel, Birgit Kindler and Noemi Cerboni

# Target Laboratories of the World

Center for Accelerator Target Science Argonne National Laboratory, Lemont, Illinois, United States Claus Müller-Gatermann, John Greene, Connor Mohs

In the last newsletter, we briefly introduced the current team of the Center for Accelerator Target Science (CATS) and summarized the objectives. This time, we want to give the promised update on our efforts in the past year, future plans and the outcome of an external review.

The performance of CATS as a national center for targets has been recently reviewed and the external committee came to the conclusion that we are meeting the goals. A few more sentences from the report shall still be shared. It might give others ideas for changes and should also decrease hesitation to reach out to CATS any time for requests.

The capabilities meet the current and foreseen demand, but flexibility to adapt to changing needs is required. User surveys identify development needs and are conducted annually. An infrastructure upgrade within a stepwise plan, also addressing the increased use of radiochemistry, is encouraged.

Considerable effort is devoted to training through dedicated workshops and open invitations for visitors; the strong outreach is taken to attract young people. The Nuclear Target Development Summer School (NTDSS) is an important activity and will be continued bi-annually, where the feedback confirms an open and welcoming environment. Activities to involve more minority serving institutions is just one example to address DEIA in our community.

The target library is currently an underutilized resource of the community. We started to work on the accessibility and structure and want to have a searchable web database long-term which keeps track of all the available targets. The archives which go back to 1968 are an invaluable source of knowledge. For future targets we will keep digital notes in the same database as the targets. It was noticed by the review committee, that proper recognition, publication and citation in target development are rare. We started to attach a letter to every target which gets delivered outside of ATLAS, where we ask for a statement in the acknowledgments that the targets were provided by CATS with funding sources. A contribution to the experimental part of publications about the target fabrication is offered.

In the past calendar year we provided a total of 703 targets, with almost 43% were shipped outside of Argonne. This service is for free for the requestor,

if no rare isotope is needed. Decisions about the use of rare isotope are only made by the DOE isotope program, but there is no restriction about dispensing spare targets. We always try to make the most efficient use of the isotope and keep additional targets in our library, preferably even in a form not attached to a specific target frame.

The targets were going all over the world and also the periodic system. Just as examples, we had to handle Beryllium, make wheels of Ruthenium, prepare plunger targets of Cadmium, work with more than half of the Lanthanide series, dispense Thorium thin foils, roll Zinc or Platinum and also use compounds of Sulfur or Iodine to provide stable targets. The requesters were from Universities in the United States (Florida State, Louisiana State, Michigan State/FRIB, Notre Dame, Texas A&M), National Laboratories (Brookhaven, Berkeley, Livermore, Oak Ridge) our international collaborators (CERN, Cologne, Grenoble, Jyväskylä, Legnaro, Paul Scherrer Institute, TRIUMF, Variable Energy Cyclotron Centre) and also high energy physics like Jefferson Lab.

Currently we are producing most of the targets with pack rolling and physical vapor deposition using both resistive heating as well as electron beams. Tube furnaces of different sizes and an induction heater are available for e.g. reductions or production of metal hydrides. We recently upgraded our plating cells for molecular and electro-plating that we are able to deposit on large areas for target wheels. Other wet methods as drop casting or pour casting are used for radioactive sources and (deuterated) polyethylene targets. We have successfully made the first real targets using High Intensity Vibrational Powder Plating (HIVIPP) and want to start improving the setup with larger areas and more isotopes.

For the near future we will try to further expand our capabilities on chemical conversion (also for beam production), specifically reductions and including radiochemistry. Recently we had to scale up our titanium reduction to several grams for isotope production and superheavy element research. We started to improve our analytical methods. The available counting setups for alpha, electron and gamma spectrometry will be upgraded with high efficiency detectors (e.g. two Clover detectors with four 70% relative efficiency crystals each instead of one smaller crystal of 25%) and a digital data acquisition. Alpha energy loss measurements and gravimetric are our standard techniques for thickness determinations, but we also have a scanning electron microscope (SEM) with energy dispersive spectrometry (EDS) as well as optical microscopes at our disposal. We are further looking into meaningful extensions (e.g. X-Ray fluorescence, 3D Laser microscopes), but with the CNM (Center for Nanoscale Materials www.anl.gov/cnm) on-site we have collaboration possibilities without procurement of expensive setups. We are using this so far only for X-ray diffraction (XRD).

One of our research projects is the production of Tritium targets using a titanium matrix. We used XRD to quantify the loading of the crystal lattice and the dependence of the environmental parameters (temperature, pressure, exposition time) using Deuterium as a surrogate. A first attempt to reproduce with tritium was made and will be in-beam soon (as we cannot use radioactive targets at CNM).

Carbon-14 and Lead-210 targets are two other examples on which we are working and have already accepted proposals at ATLAS. Very soon we will production targets start to work on for nuCARIBU (www.anl.gov/atlas/reference/atlas-2018-strategic-plan). nuCARIBU will use "thick large area targets" (~ 4 inch diameter and 5-10 mg/cm2) of Uranium-235 and Plutonium-239 to produce fission fragments with a neutron generator, other targets like Californium-249 or Thorium-229 are possibilities to shift the mass peak later. For another big project in the strategic plan, the N=126 factory we just finished a full wheel of 16 targets of natural platinum of 5mg/cm2. The factory will use multi-nucleon transfer reactions (MNT) on platinum isotopes to neutron-rich isotopes at the N=126 shell closure. A change to enriched platiunum-198 targets after a proof of principle is planned. By changing the targets to e.g. Samarium-154 or Dysprosium-164, other regions of the nuclear chart become accessible as well.

If you have any need for targets especially if development is needed, please feel free to reach out. We would be grateful as well if you would fill out a short survey (https://forms.office.com/g/U0LmQ360r4) of your general target needs. That is not understood as an order but to be aware where development should be focused and a valuable input for future requests towards funding agencies where investment is needed.

This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of Nuclear Physics, under Contract No. DE-AC02-06CH11357. This research used resources of ANL's ATLAS facility, which is a DOE Office of Science User Facility.



Figure 1: QR-code to survey.





Figure 2: Cadmium-116 plunger target electroplated on a gold backing. A surface flatness of 5 micrometer of the stretched target was reached (3D Laser microscope picture on the right).



50 µm

Figure 3: Test for the Lead-210 target, electroplated natural lead on a gold backing, SEM picture and EDS analysis showing 78% mass of Pb 17% of Au backing and contaminant on the percent level C, O and F from the solution.





Figure 5: Two pellets of pressed Titanium-50 (750mg each) for beam production at Berkeley National Laboratory.

Figure 4: A full set of targets for a 16 sector wheel, here 0.4 mg/cm<sup>2</sup> Lead-206 on carbon backings.



Figure 6: A setup for tritiating Titanium foils with a small tube furnace on the left, self-build manifold system on the right and several deuterium loaded target foils using different pressures and exposition times on the adjacent picture. The tritiated foils are shown below.

# "Targets for Nuclear Physics" within the EURO-LABS project

INFN –Laboratori Nazionali del Sud (LNS), Italy INFN –Laboratori Nazionali di Legnaro (LNL), Italy V. Soukeras, M. Cavallaro, J. Esposito, for the EURO-LABS WP2.5.2 collaboration



The EUROpean Laboratories for Accelerator Based Science (EURO-LABS) project (https://web.infn.it/EURO-LABS/) brings together, for the first time, the research communities of nuclear physics, accelerator and detector technologies for high energy physics, in a pioneering super-community of sub-atomic scientists. EURO-LABS began in September 2022 and will run for 4 years having a total budget of 14.2 M€ funded by the European Union's Horizon 2020 Research Infrastructure services advancing frontier knowledge under Grant Agreement no. 101057511. EURO-LABS is a network of 33 research and academic institutions from 18 European and non – EU countries, involving 47 Research Infrastructures, ensuring diversity and actively support researchers from different nationalities, gender, age, grade, and variety of professional expertise.

Into this context, the European nuclear target community has benefited by funds within the EURO-LABS work package WP2-5-2 on "targets for Nuclear Physics". It is part of the work package "Access to Research Infrastructure for Nuclear Physics" and in particular of the task "Service Improvements", being a joint project by different institutions namely: the INFN – LNS, INFN – LNL and INFN – Turin in Italy, GSI/FAIR in Germany, GANIL, CNRS – IJCLAB, CNRS – IPHC Strasbourg in France, University of Warsaw/HIL in Poland, IFIN – HH in Romania, LIP/FCUL – Lisbon in Portugal and PSI in Switzerland.

The goal of the activities of WP2-5-2 is to gather the community of nuclear target makers and users having specific expertise in the field of target manufacturing and characterization, both for nuclear and applied physics purposes. It is a bridge between different research areas, including but, not restricted to fundamental nuclear physics, targets for strippers and neutron converters as well as target development for medical radioisotope production. In more details, we aim to set the state of the art of existing target materials and improve the available fabrication techniques. Target characterization procedures are also essential towards the selection of the most suitable manufacturing procedure. Last but not least, we aim to foster the synergies between the nuclear physics institutions in Europe and associated countries as well as with existing associations such as the International Nuclear Targets Development Society (INTDS). Therefore, the project promotes the effective collaboration and networking among different laboratories and research groups, sharing ideas and projects, improving the

services to the nuclear target community at a research infrastructure distributed across the participating research institutions.

The initial phases of EURO-LABS have already led to an intense and constructive activity of networking and exchange of information among the involved research institutions. A post-doc was hired currently working on the project while, for a second one the procedure is ongoing. The first milestone of the project has been delivered and the development of a database with the available targets and techniques at all the involved laboratories is in progress.

#### GANIL, Caen, France Christelle Stodel & Mickael Dubois

The French Institute for Nuclear and Particle Physics (IN2P3) of Centre National de la Recherche Scientifique (CNRS) has conducted from 2019 to 2022 a review of the roadmap for Nuclear Physics in France, during which mid- and long-term perspectives have been discussed within the community (<u>https://prospectives2020.in2p3.fr/</u>). The conclusions of this review permitted to define objectives for the decade ahead. To meet these defined scientific and technical challenges, IN2P3 wanted to take stock of the skills and specializations available or lacking within the institute.

In this context, GANIL has organized a workshop, entitled "Ion Sources and 6<sup>th</sup> 8<sup>th</sup> Targets" from September to 2023 (https://indico.in2p3.fr/event/28990/). The scope of the workshop encompassed the development of ECR ion sources for intense stable beam production and acceleration, ISOL target-ion source systems for radioactive ion beam production and targets for experiments using low energy beams, to study nuclear structure of exotic isotopes, or nuclear reaction mechanisms. The workshop combined presentations reviewing the state of the art of the aforementioned techniques in France and in the world, and exchanges on methods and tools, including the requested skills, necessary for the realization of the ambitious scientific program carried by the French and the international scientific and technical community at GANIL-SPIRAL 2, i.e. with the cyclotrons and the SPIRAL2 LINAC in experimental areas such as S<sup>3</sup>, NFS or DESIR, apart from the ones served by the cyclotrons (LISE, VAMOS etc.).

Concerning targets, as their need will increase significantly in the coming years, particularly with the commissioning of the S<sup>3</sup> spectrometer, and as efficient target production is a major challenge, being mandatory for the success of the various nuclear physics scientific programs, it was recommended in the conclusions of the prospective work, to increase their development capacities for standard materials and actinides as well as for cryogenic samples. A session, dedicated to these issues, was based on this recommendation and elaborated on the topic in six contributions and a round table discussion. Firstly, Ch. Stodel introduced the subject by recalling the use and specifications of targets, and by mapping out the European and national landscape of institutes and laboratories with experience and skills in the field of target production. Then F. Pérocheau (GANIL) reviewed the GANIL nuclear target laboratory with its equipment, current target production capabilities, in number and diversity. He presented techniques such as evaporation and rolling, being part of the know-how of GANIL's expert. He also underlined the requests and the prerequisites for the very much needed upgrade of the laboratory. from GSI described precisely the various activities

of the GSI target laboratory, i.e. material procurement, preparation and production of thin and thick targets, chemical procedures applied for source material, characterizations of material properties etc. G. Sibbens presented the European Actinide Target laboratory from JRC Geel with its unique techniques for preparation, fabrication and characterization. Two complementary talks were given by J.M. Gheller and A. Cadiou focusing on cryogenic targets and targetry, i.e the development of irradiation systems for highly intense beams. It was emphasized that all these strategic groups within each research infrastructure specialize in target techniques according to the specifications and needs of the experiments performed on the specific site.

The round table discussion was rich in exchanges related to the organization and management of each laboratory, the skills, the limits of outsourcing, the sharing of know-how, the attractiveness for new staff. But it touched also topics like operating constraints, the reprocessing of used targets and others. The participants in the discussion emphasized the importance of uncommon skills and pointed out the considerable expertise acquired over the years to carry out these delicate target-related activities. However, as these skills become increasingly scarce, it was sustained that a concerted response is urgently required. This lively session concluded with a consensus on the importance of having a target laboratory on the GANIL site with the skills and capacity to produce the large number of targets required by the actual and envisaged scientific needs. It supported the consolidation of the upgrade project for the existing GANIL (stable) target laboratory with new equipment and an increase of the staff. In addition, the project for a French actinide target laboratory has emerged, with a pre-study to find the best European model to meet our needs. We want to thank the representatives of the European laboratories, participating in the round table discussion, who stated their readiness to provide significant support for the development of this laboratory, in terms of advice and training of new employees in the various manufacturing techniques.

# SANDA–workshop on actinide target preparation and characterization – the need for radioanalytical chemistry, JRC Geel site, 5 – 7 December 2023

European Commission, Joint Research Centre (JRC), Geel, Belgium Goedele Sibbens

From 5 to 7 December 2023, the Unit Nuclear Data and Measurement Standards of JRC Directorate G – Nuclear Safety & Security located in Geel [1] hosted the workshop on actinide target preparation and characterization – the need for radioanalytical chemistry. The aim of this workshop was to share knowledge and experience among actinide target production and radioanalytical chemistry laboratories for various applications across different domains: Nuclear Fuel, Nuclear Research, Nuclear Medicine, Environmental Monitoring, Nuclear Waste Management, Space Exploration, Security and Safeguards etc. The topics discussed were in function of the preparation and characterization of thin layers of actinides used as "targets" for accurate neutron-induced reaction measurements.

The workshop provided the space bringing together a large number of nuclear chemistry experts with a diverse background for scientific exchange and to their mutual appreciation. Looking for and building on synergies by creating space for networking and closer collaboration will help to become more efficient in this high costly, labour and resources intensive research work. This is confirmed by the finding during the organization of the workshop that only a small group of laboratories in Europe has the knowledge, competence and capacity to handle actinide material of high purity while there is an increasing demand for tailor made high quality and well-characterized actinide targets for accurate nuclear measurements on key isotopes and reactions.

The workshop was organised by the Nuclear Target Preparation laboratory [2] of JRC Geel as a contribution to the SANDA project [3]. SANDA stands for Supplying Accurate Nuclear Data for energy and non-energy Applications. Accurate nuclear data are of fundamental importance in a number of nuclear and non-nuclear fields. The EU-funded SANDA project aims to produce a data library containing high-quality nuclear measurements on key isotopes and reactions. The project puts special focus on how data is measured, evaluated and validated. These high-accuracy nuclear data can be exploited by safety authorities, research institutions, nuclear industry and health organisations. SANDA aims at disseminating its results widely and efficiently among EU member states by making effective use of databases and networks of the Nuclear Energy Agency (NEA) of the Organisation for Economic Cooperation and Development (OECD) and the International Atomic Energy Agency (IAEA). One of the important pillars in the SANDA project is the availability of tailormade high-quality and well characterized thin actinide layers for nuclear data measurements. The demand for these targets, consisting of a freestanding or a material supported on a substrate, is high. Beside the high quality of these actinide targets, it is mandatory to characterise accurately the number of atoms per unit area of the isotope of interest, the homogeneity and the presence of contaminants and impurities influencing the determination of reaction cross-sections by measurements. Prior to the use of actinide materials for target preparation a purification and identification of the radioelement of interest by radioanalytical chemistry is indispensable. The target characteristics influence the results of the experiments and their quality has a strong impact on the total uncertainty of neutron-induced reaction data.

Recently the critical role of nuclear energy for reducing the effects of climate change has been recognised at the COP28 [4], in the Declaration of the EU Nuclear Alliance and in the Net-Zero Industry Act [5]. Research supporting nuclear safety, security and safeguards will become even more prominent in the future. Commissioner Iliana Ivanova stated in her speech in March 2024 that preserving the critical research and skills capacities in the nuclear field is paramount for addressing the challenges we are all facing [6]. This is only possible when joining forces.

The workshop brought together experts from 12 different nuclear laboratories and delivered 22 presentations related to actinide target preparation, characterization and radioanalytical chemistry. The last day ended with a visit of the laboratories for Nuclear Target Preparation, Nuclear Mass Spectrometry and Nuclear Chemistry.



SANDA workshop participants

[1] https://joint-research-centre.ec.europa.eu/index en

[2] <u>https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/jrc-specific-target-preparation-neutron-induced-reaction-measurements-2021-04-16\_en</u>

[3] <u>http://www.sanda-nd.eu/</u>

[4] <u>https://www.oecd-nea.org/jcms/pl\_89153/cop28-recognises-the-critical-role-of-nuclear-energy-for-reducing-the-effects-of-climate-change</u>

[5] <u>https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-</u>

deal/green-deal-industrial-plan/net-zero-industry-act\_en

[6] https://ec.europa.eu/commission/presscorner/detail/en/SPEECH\_24\_1611

#### Summary record of the INTDS Virtual Meeting 2023/2024

The Board met for several virtual meetings with in-between e-mail discussions and decisions between October 5<sup>th</sup>, 2023 and February 15<sup>th</sup>, 2024.

Temporary guests:

1) Dorothea Schumann for Conf

Conference Summary INTDS 2022

John Greene for

Updating INTDS bylaws

#### Miscellaneous Votes:

Birgit was confirmed as Secretary with unanimous assent.

The previous minutes of the 2022 Board Meeting at PSI were accepted without changes or comments.

#### <u>Reports</u>

**Newsletter (NL) report:** Birgit presented the NL report. No questions or remarks.

NL #49 was sent on 6<sup>th</sup> of December 2022 (125 recipients) and #50 (120 recipients) on 26th of May 2023.

In 2022, Noemi Cerboni joined our NL team and introduced a new design in #50.

The next NL is planned for December 2023. (#51 sent on 12.12.2023)

#### 2.2. Dannie presented the INTDS Financial Status Report (Report attached)

The Karasek Fund is negative in the moment but will be replenished from the normal INTDS fund, as already decided by the Board previously.

The funds of the INTDS are slowly but constantly decreasing but Dannie sees no reason for direct actions. In the past, the INTDS published the conference proceedings in its own authority and therefore had to keep more money at hand. At the PSI conference the membership fee was waived, this decreased the INTDS account.

Also, for the previous conferences, the fee was not sufficient to bear the costs.

The level of reserve to have on hand will have to be discussed and decided on in a following board meeting.

#### Motion:

The fee for normal members will be raised to 100 USD for 2 years.

Emeriti do not pay any fee.

The fee for sustaining members is fixed to 500 USD for 2 years

(They can present ads or logos in the NL and on the INTDS website free of charge and can be mentioned as sustaining member at the conferences – clear differentiation from sponsors!) – Check on ethic issues before approval of a sustaining membership!

The motion was adopted unanimously. Information sent to INTDS members.

**2.3.** Dannie presented the **INTDS Membership Status Report** (Report attached)

The by-laws have to be adapted regarding the membership possibilities. (Done)

The possibility and the associated privileges of a sustaining membership have to be announced on the website (and in a NL). (Done)

Application form for the two levels of membership. (Done)

# **2.4** Anna presented the report on **Status of the website/INTDS database** Website since our last meeting was not changed significantly.

The Bibliography Index is updated with accepted contributions to the proceedings of the last meeting. Unfortunately, EPJ is not requiring the keywords so manuscripts were submitted without them what influences our bibliography index.

The Board appreciated the work of Anna on the data base and the website emphatically.

Motion: The Board awarded Anna Stolarz as an INTDS emeritus.

The motion was adopted unanimously.

Anna accepted and thanked for the honour of the status though she is still an active member of the society!

#### Items of the discussion following the report:

# Every one of the board is invited to submit keywords to their papers of the previous conference(s)!

Matt will take care that at least three keywords are included for the papers when submitting them for the conference proceedings.

The Board agrees that a second administrator for the INTDS website is necessary and will add this item to the agenda of the next board meeting. Additionally, the president always has to have full administrator rights to the website.

The updated membership information should be edited on the web. (Done)

Is there place on the web where all motions of the Board can be found? Anna: All minutes can be found on the restricted Board Corner.

=> Birgit volunteers to draft a file with a collection of the motions of the previous years. (Done)

**2.5** Bettina presented the **Report of the Nomination Committee** (Bettina, Emilio, Wim):

<u>Positions:</u> 4 positions expire and have to be elected, favorable at least 8 candidates, favorably distributed over the continents.

The nomination committee asked for suggestions and contacted several potential candidates with special emphasis on finding a suitable candidate in Asia or Japan, respectively.

Additionally, the committee made the following recommendations for the election in 2016: Several candidates of the same institution in one ballot should be avoided.

It was discussed how to better represent the diversity of the members regarding continents or countries, respectively. Still, if we cannot identify people that are active in the society and that are willing to stand for elections then, unfortunately, we cannot change it.

#### Report on INTDS 2022 (Dorothea Schumann)

**Finances:** Due to payback of taxes and lower cost for the conference dinner than expected, there was a surplus in the budget that was transferred directly to Oak Ridge. Matt will take care that the money will be spent and correctly recorded as financial contribution of the INTDS.

**Proceedings:** 53 oral contributions at the conference; 2 manuscripts rejected; 28 articles published in EPJ Web of Conferences Volume 285 (2023). Published 22 June 2023. Every paper had at least 2 referees, some had 3.

#### 4. Update of the Bylaws

#### 4.1 Legal affairs

The lawyer was satisfied with the version presented by Matt end of 2022! After a last legal check, the non-profit status of INTDS will be approved up to April.

The legal counselling up to now was pro bono since it was done by law school students. But the INTDS will have to pay for the legal approval.

Christelle as president of the INTDS appointed John Greene and Matt Gott for the committee to revise the bylaws of INTDS. The role of this committee is as follow:

"The committee is responsible for revising the INTDS by-laws in accordance with the process described in the 1992 official document. The committee will draw on the comments made at the annual board meetings to consider the reincorporation of the society with a non-profit status, to make the clauses readable and the provisions described (voting procedures, admission of new members, operation of the general meeting, etc.) applicable."

Both accepted the appointment, and a detailed time schedule was presented.

#### 4.2 General questions and remarks

Changes of the by-laws have to be approved by the members. The changes will have to be sent to all members 6 weeks in advance together with a ballot. (Done)

With sustaining membership, one representative gets the equivalent status as a regular member including the eligibility as an officer.

If someone leaves the board for any reason, the Executive Board can decide by a majority whether a position is filled in a special election or remains vacant until the next regular election.

#### 4.3 Voting

The report of Matt was followed by an intensive discussion on the election process of president and vice-president and on the privileges of the different positions:

Elected directors are entitled to vote, the president and the vice-president are only entitled to vote, if they are also elected directors

It is possible to be an elected director and to have a position as appointed officer in parallel.

Appointed officers are in advisory capacity.

The position of past-president ensures the continuity of the society, also in advisory capacity and will be mentioned no more in the bylaws.

By subsequent secret online voting, it was decided by a quorum of the Board of Directors to **RETAIN the automatic transition of Vice-President to President**.

The vice-president is appointed by a majority of the Executive Board.

Motion: The elected directors voted openly on sending the updated bylaws together with the old ones to the members for their information. The motion was adopted unanimously

Christelle will appoint Dannie as the teller for a permanent record via INTDS legal access. (Done)

Participants of the MSU and of the PSI conference are actual members of the INTDS until the start of the INTDS 2024.

#### INTDS 2024 (Matt Gott)

<u>31st INTDS conference</u> will take place at the HYATT PLACE in downtown Knoxville **from 18<sup>th</sup> to 23<sup>rd</sup> August 2024**.

Rooms are blocked from Saturday to Saturday, for board members from abroad already Friday would be preferable.

The participation at the conference and all social events will be open to everyone who gets a visa.

Conference fee will be 600 USD for INTDS member and 800 USD for non-members.

The membership fee will have to be collected independently from the conference fee!

#### Questions and remarks concerning the conference:

Any new members will have to pay the enhanced fee.

Since the actual INTDS membership is the prerequisite for profiting from the reduced registration fee to the INTDS2024, all members will have to pay their dues in advance. => Dannie will write a draft for a letter that will be sent to all actual members with the information of the increase of the membership ship, the request to renew the membership in advance of the conference, and a bill with the actual fee. (Done)

Every renewed member will get a code that has to be filled in during registration for the conference in order to profit from the reduced fee. The board is aware of the problem that by collecting the fees separately from the conference fee some members will not be reimbursed by their institution.

#### Grants:

Dannie reports that in the past, a maximum of 5 grants with a maximum of 1.200 USD per grant were planned, but seldom really all grants were awarded. The grant could perhaps be increased to 1.500 USD.

Eventually, the organizers of the conference were asked for additional support in form of waiving of the conference fee or cheaper accommodation. Each candidate for a grant has to fulfill the following prerequisites:

- Approval of the abstract by the scientific committee.
- Submitting the full paper at beginning of the conference.
- Oral presentation of the paper.

#### Next conference in 2026

Possible Candidates:

• CERN: Wim would have to discuss with his management.

It would be again Switzerland. CERN has its own rules, financing of conferences is decided in a budget conference and there everyone is obliged to submit his or her paper at the end of the conference. 2026 would be a good time for visiting CERN since a long shutdown is planned so that all accelerators are open for visitors.

- Japan?
- Romania or South Africa could be candidates for 2028

It was decided to send a call for hosting one of the next conferences. (Done) The "Conference Guidelines" will have to be validated.

A contract with all legal commitments between INTDS and the conference host will have to be concluded.

Birgit Kindler for the minutes, 5<sup>th</sup> March 2024

Motions are marked in yellow.

ToDo's are written in red.

Tasks already completed are written in green.

# INTDS Financial Status Report

For the period from September 19 <sup>th</sup> , 202 (all amounts in U.S.	22 to November 16 <sup>th</sup> , dollar)	2023
Previous balance (total of all accounts) January RECEIPTS:	31 <sup>st</sup> , 2022	\$ <b>34,493.71</b>
Interest earned (all accounts) Dues collected (2 Dues paid)	\$5.00 \$100.00	
SUBTOTAL	\$105.00	+\$105.00
DISBURSMENTS:		
Matt Gott legal fees INTDS 2022 Conference Pay Pal fees (total on 2 Dues payment) Karasek grant (Noemi Cerboni)	\$100.00 \$4,121.62 \$3.75 \$346.40	
SUBTOTAL	\$4,571.77	-\$4,571.77
Balance on hand (total of all accounts) (November 16 <sup>th</sup> , 2023 Bank statement)		\$30,026.94
Individual account balances as of November 1	6 <sup>th</sup> , 2023	
Interest-bearing account Business partner checking Web dues receiving (checking account) Pay Pal account	\$24,771.11 \$3,468.16 \$1,787.67 \$0	
TOTAL	\$30,026.94	
Frank Karasek Memorial Fund		
Balance on hand (9/19/2022) Grant Balance on hand (11/16/2023)	\$53.67 \$346.40 (\$292.73)	
Respectfully submitted on November 16 <sup>th</sup> , 202	3	
Dannie Steski	Matt Gott	

Treasurer, INTDS

Assistant Treasurer, INTDS

### INTDS Membership Report

November 16<sup>th</sup>, 2023

	Sept. 2022	Nov. 2023
Paid Member	68	69
Emeritus <b>Total</b>	<u>12</u> 80	<u>13</u> <b>82</b>
Paid Membership by Continent:		
Europe	22	23
North America	34	35
Asia	9	9
Africa	2	2
Australia	1	1
South America	0	0
Middle East	0	0

2 new members have joined since September 2022

Waiting for list of members from PSI Conference

Respectively submitted,

Dannie Steski INTDS Corresponding Secretary/Treasurer

Matt Gott INDS Assistant Treasurer Dear Esteemed Members of INTDS,

We thank you for voting the amendment of the proposed new by-laws and with this message we are pleased to inform you about the results and answer to the raised questions.

The results are the following:

Participation 16 votes, the new by-laws passed with 14 votes in favor and 2 votes against. The next step is to submit the paperwork for the society to be recognized as a non-profit organization.

We received two remarks concerning the text and we have reviewed them:

- 1. The first remark concerns the Procedure of the Board of Directors' Election Process. Indeed, this part was missing although it was discussed and under consideration during the review. This procedure has not changed, and we propose to add it as an addendum to the new by-laws.
- 2. The second remark received was about the nomination of president and the vice president as "officers", a topic largely debated, discussed among the directors of the board during the review and concluded with a consensus to maintain them as officers and being elected by the board of directors. As already written, the procedure of (vice)president election and nomination as officers was not changed (1992 by-laws article IV Officers Section 1 & 2; 2024 Article VII Section 7.01 & 7.02). The text formulation was reviewed to become more explicit, and roles of main officers were detailed.

With the hope that this will answer your questions, our best regards, Christelle Stodel, on behalf of the INTDS board of directors

#### Updated information:

The new INTDS by-laws are officially accepted! In future, they can be easily amended with an addendum regarding forgotten pieces or upcoming new issues. You can find the text now on the <u>INTDS website</u>. In a next step, the INTDS will regain its tax-free status.

Many thanks go to John Greene, Matt Gott and Dannie Steski for their persistent work on this issue!

### Election of the Board of Directors 2024

The terms for the four positions on the INTDS Board of Directors, currently occupied by Matthew Gott, Ntombizonke Kheswa, Goedele Sibbens, and Yoshimoto Masahiro, are set to expire in August 2024.

Currently, the INTDS Board comprises the following individuals, with their respective terms of service indicated in parentheses:

President (2020 - 2024)	Christelle Stodel, GANIL, Caen, France
Vice-President (2020 - 2024)	Ntombizonke Kheswa, iThemba LABS, Cape Town, South Africa
Past-President (2020 - 2024)	Klaus Eberhardt, Gutenberg-University, Mainz, Germany
Board of directors:	
Term (2022 – 2026)	Bettina Lommel, GSI, Darmstadt, Germany Emilio A. Maugeri, PSI, Villigen, Switzerland Wim Weterings, CERN, Geneva,
Switzerland	
Term (2020 – 2024)	Matthew Gott, ORNL, Oak Ridge, USA Ntombizonke Kheswa, iThemba LABS, Cape Town, South Africa Goedele Sibbens, EC JRC, Geel, Belgium Masahiro Yoshimoto, J-PARC, Tokai, Japan
Appointed officers:	
Corresponding Secretary and Treasurer (since 2018)	Dannie Steski, BNL, New York, USA
Treasurer assistant (since 2020)	Matthew Gott, ORNL, Oak Ridge, USA
Recording Secretary (since 2010)	Birgit Kindler, GSI, Darmstadt, Germany
Newsletter editors (since 2019)	Bettina Lommel, GSI, Darmstadt, Germany Birgit Kindler, GSI, Darmstadt, Germany Noemi Cerboni, PSI, Villigen Switzerland
Bibliography database	Anna Stolarz, University of Warsaw, Poland
manager (since 2000)	-
Webmaster (since 2008)	Anna Stolarz, University of Warsaw, Poland

The Nominating Committee, consisting of Bettina Lommel, Wim Weterings, and Emilio A. Maugeri, appointed by the INTDS President, presents five candidates for consideration by the INTDS members. The newly elected directors will commence their four-year term following the election and subsequent inauguration during the 2024 conference at ORNL in Knoxville, USA. INTDS members may vote for up to four candidates. The candidates are introduced in alphabetic order:



My name is Matt Gott; I am currently the Group Leader for the Stable Isotope Materials and Chemistry team at Oak Ridge National Laboratory (ORNL). In this role, I lead a skilled set of scientists to produce a wide variety of chemical and target forms of isotopically enriched materials. Prior to joining ORNL, I was part of the Center for Accelerator Target Science (CATS) within the Physics Division at Argonne National Laboratory,

where I first learned target fabrication under the leadership of John Greene. I focused on research developing target system and performing nuclear data measurements as both a postdoc and staff scientist from 2018 to 2021 and then lead the CATS from 2021 to 2022.

As a target enthusiast, I have served the society both as a Director and as the Assistant Treasurer since 2020; I am co-chairing the 31st Conference of the INTDS in Oak Ridge; and I have helped to modernize the INTDS bylaws as well as re-establish the society as a non-profit in the US. In serving the INTDS, my goal is to help attract next generation scientists to this field, continue to help innovate in this field, and push the importance of this field to the broader scientific community.



I am Ntombizonke Kheswa from NRF/iThemba Laboratory for Accelerator Based Sciences, South Africa. My activities within my organization includes research on target material science and their development using various techniques and application. When I discovered about INTDS, I found it as the platform that will enable me to grow my target making skill given that I was new in the field. On the other hand, I realised that I

could contribute positively on the development of other personnel in target making field by sharing my skill through presentation during conferences, newsletter publications and networking during conferences and afterwards. I have been a member of INTDS since 2006 and been serving in the INTDS as a director of the board since 2014. My term to serve as director is coming to an end in 2024. It was during my term in the board that as a team we managed to host a successful INTDS2016, the first time on the African continent.

During my term as a director, a lot has been achieved by the executive board to better the affairs of the society and to ensure the existence and resilience of the society in order to make a meaningful contribution to the society at large. My never-ending desire to continue contributing positively to the sustenance and continuous improvement of the society has made me realise that I am keen to serve in another term as the director of the board.



My name is Dannie Steski, I am employed by Brookhaven National Laboratory (BNL) in Upton, NY, USA. I am currently Head of the Tandem Van de Graaff Facility. I have been an INTDS member since 2006 and on the Executive Board of the INTDS since 2008. I have been the Corresponding Secretary and Treasurer since 2018. Previously I was the Assistant Treasurer under David Gilliam.

My field of interest is carbon stripper foils for use in Tandem Van de Graaffs. I make many of the carbon

stripper foils in-house using the Arc Discharge technique. We also purchase Laser Plasma Ablation (LPA) foils from Munich when a long foil lifetime is required. In addition, I have been involved in producing carbon micro-ribbons used in the polarimeter at the Relativistic Heavy Ion Collider (RHIC). This technique was pioneered by long time INTDS member Bill Lozowski from Indiana University. It involves making carbon ribbons with a width of 10 mm, a thickness of 50 nm and a length of 25 mm. This work has been reported at several INTDS conferences.

Over the years, I have had the great pleasure of meeting many of you at previous INTDS conferences and learning many tips and tricks for foil production. I look forward to seeing you at future INTDS conferences.



Christelle Stodel, CNRS Physicist, Grand Accélérateur National d'Ions Lourds (GANIL), Caen, France

After training as an instrumentation engineer, I joined GSI's SHIP group in 1996 to prepare a PhD in nuclear physics in collaboration with the Laboratory of Corpuscular Physics of Caen (LPC). My prominent supervisors introduced me to the fabulous world of super-heavy elements (SHE), with all their mysteries about their structure and their manufacturing recipes.

After some post-doctoral positions, I started working as CNRS scientist at GANIL in 2000 where I am part of the team tuning the LISE spectrometer for experiments related to the study of exotic nuclei. In parallel, I'm continuing my research into SHEs, in particular on the reaction mechanism. To produce these SHE efficiently, research and development on targets and the associated spectrometer are essential. I was then in charge of the upstream beam line of S3 (Super-Separator Spectrometer). With a team of technicians, physicists and engineers, we designed and put into operation targets station for S3 with its instrumentation aiming at controlling the integrity of targets during irradiation. Large consumer of thin targets, I became the scientific referee of the target laboratory of GANIL. We are developing continuously the processes of fabrication and characterization for each required targets, mainly metallic ones with PVD technics and we update the equipment for the future needs, maybe including actinide targets. These achievements result from constructive

exchanges with INTDS members. Having hosted the 24th INTDS conference at GANIL and being welcomed in its board in 2008 as elected director and president from 2020, I had the great pleasure to serve the society as best as possible. I hope the INTDS will continue to be an effective and humane infrastructure for sharing target-related techniques with experts and newcomers alike.



My name is Constance (Connie) Stoner, and I am the President of The Arizona Carbon Foil Co., Inc. dba: ACF-Metals. I have over 35 years of experience working in, and with others in the global target community, and I believe that INTDS plays a crucial role in the quality of present and future target makers. It is for this reason that I am interested in becoming a member of the INTDS Board. Over the past ten years, I have had the privilege to orchestrate

ways for ACF to contribute in closing the gap between relevant professional disciplines pertinent to target making and the increasing global momentum in this field by setting up on-line forums and participating in global conferences and agenda meetings.

I recognize how INTDS plays a crucial role in this field and leaning in to shoulder the connected responsibilities is a very natural progression for me. My hope is that through our increased collaboration with individuals, industry partners, and researchers from all over the world, we will foster personal connections and new growth in the culturally diverse environment of INTDS of which I'm pleased to be a member.

Participating as a member of the Board of Directors requires commitment to the goal, being willing to set aside necessary time, ask difficult questions, look for creative solutions, and communicate effectively keeping in mind the INTDS health and scientific direction to which I am committed. I received my education from the University of Arizona (1987), followed by working alongside my father, Dr. John O. Stoner Jr. who is now mostly retired. I am the second generation of carbon foil manufacturers, and happy to say now actively cultivating the third generation.

## **Target Maker's Introduction**

Isotope and Target Chemistry Group, Laboratory of Radiochemistry Paul Scherrer Intitut, Villigen PSI, Switzerland Zeynep Talip



Since April 2024, Zeynep Talip has been appointed as the Group Leader of the Isotope and Target Chemistry Group at the Radiochemistry Laboratory of the Paul Scherrer Institute (PSI). During her doctoral studies at the Institute for Transuranium Elements in Karlsruhe, Germany, she conducted pioneering research on the impact of stoichiometry on helium solubility and diffusion in both single and polycrystalline UO<sub>2</sub> and U<sub>3</sub>O<sub>8</sub> matrices. After earning her Ph.D., she leveraged her expertise in a new project at the Radioactive Materials and

Processes Laboratory of the Commissariat à l'Énergie Atomique (CEA) in France. There, she developed methodologies to analyze the oxidation behaviors of MOX fuel using Raman Spectroscopy and Electron Probe Microanalysis. Between 2015 and 2018, she served as a postdoctoral researcher at PSI, focusing on a project titled "Exotic Radionuclides from Accelerator Waste for Science and Technology-ERAWAST-irradiated W and Ta as sources for Lanthanides", under the guidance of her predecessor, Dorothea Schumann. Her work involved determining the cross sections of long-lived radionuclides, which are critical for managing long-term waste disposal in accelerator-driven systems and spallation neutron source facilities.

In November 2022, she was tenured as a scientist at PSI, specializing in the production of medical radionuclides for innovative radiopharmaceuticals, from targetry to preclinical applications. Throughout her career, she has contributed to various facets of radiochemistry, including targetry, radionuclide production, nuclear data determination, and the development of chemical separation methods.

PSI, Isotope and Target Chemistry Group primarily focuses on producing radioactive targets using various techniques such as electrodeposition, molecular plating, coupled reduction, physical vapor deposition, and droplet deposition. To ensure the quality of the produced targets, the group employs multiple characterization techniques to assess activity, uniformity, homogeneity, thickness, and purity. Techniques available at PSI include alpha and gamma spectrometry, radiography, scanning electron microscopy (SEM), energy-dispersive X-ray spectroscopy (EDX), X-ray photoelectron spectroscopy (XPS), X-ray diffraction (XRD), and Raman Spectrometry. These rigorous processes guarantee that each target precisely meets the experimental requirements.

## Target Maker's Conclusion – Dorothea Schumann

Isotope and Target Chemistry Group, Laboratory of Radiochemistry Paul Scherrer Intitut, Villigen PSI, Switzerland Noemi Cerboni, on behalf of the Laboratory of Radiochemistry

Paul Scherrer Institute's (PSI) Laboratory of Radiochemistry bid a sad farewell to Dr. Dorothea Schumann, leader of the "Isotope and Target Chemistry" group, who retired after 20 years of dedicated service.

Throughout her scientific career at PSI, Dorothea contributed significantly to the advancement of radiochemistry. With her knowledge and expertise, Dorothea has led crucial steps towards the separation and nuclear characterization of exotic radionuclides extracted from irradiated materials, be it nuclear waste or irradiated targets, leaving an indelible mark on our scientific community. From her many scientific achievements, we wish to highlight several key contributions. These include the determination of the half-lives of Fe-60, Gd-148 and Dy-154 as well as the chemical separation of Al-26, Si-32, Ca-41, and Ti-44 from proton-irradiated vanadium targets. These efforts are significant for their future use in fundamental research and even nuclear medicine, particularly in the case of Ti-44. Additionally, Dorothea worked on the production of Be-7 targets for enabling the measurement of its neutron cross-section, which is crucial for understanding Big Bang nucleosynthesis and, consequently, the production of the lightest nuclides in the earliest stages of our universe. In addition, we remember her strong commitment towards the INTDS by actively participating as a member and coorganizing the 30<sup>th</sup> INTDS conference at PSI in 2022.

Dorothea has not only demonstrated exceptional expertise in her field, but has also been an inspiring mentor and colleague, guiding the next generation of scientists. As Dorothea transitions into retirement, we take this moment to express our deepest gratitude for her numerous contributions and support to our scientific community.



Dorothea during one of her favorite activities (besides lab work): enjoying wine with her husband Rugard.

# Third Announcement for the INTDS 2024

# 31<sup>st</sup> Conference of the International Nuclear Target Development Society



Third Announcement

Hyatt Place Downtown, Knoxville, Tennessee, United States

August 18-23, 2024

Dear Colleagues,

Oak Ridge National Laboratory is excited to invite you to the 31<sup>st</sup> Conference of the International Nuclear Target Development Society (https://www.intds.org/) at the Hyatt Place in downtown Knoxville, Tennessee, USA from August 18<sup>th</sup> to August 23<sup>rd</sup>, 2024.

The INTDS Conference covers current research and challenges in target development and application. The conference format includes general talks and oral contributions selected from the abstracts submitted to the scientific committee.

The conference website is available at: <u>https://intds2024.ornl.gov/</u>. It will be continuously updated with the newest information and announcements.

Abstract Submissions are Due Soon! Participants are invited to submit their contribution to topics and subjects related to nuclear target fabrication, preparation, usage, and much, much more! Please see the website for the full list of suggested topics.

Limited Availability for ORNL Tour: Participants interested in taking a tour of the Spallation Neutron Source (SNS) or High Flux Isotope Reactor (HFIR) facilities on ORNL campus are encouraged to reserve their spaces quickly. Due to the capacity of each facility, only a limited number of participants may sign up for a slot on these tours. The deadline for registration of these tours is July 19<sup>th</sup>. Please see the website for additional information about the facilities, and how to sign up for the tours.

#### Important Dates:

April 15 <sup>th</sup> , 2024	Abstract Submission Deadline
May 13 <sup>th</sup> , 2024	Notification of Acceptance
July 19 <sup>th</sup> , 2024	Registration Deadline with ORNL Tour
August 9 <sup>th</sup> , 2024	Registration Deadline
December 31 <sup>st</sup> , 2024	Manuscript Submission Deadline for Conference Proceedings

#### Useful Information

#### Hotel Map, Parking + Transportation

Located at the corner of S Gay Street and Clinch Avenue, Hyatt Place Knoxville / Downtown is an ideal jumping-off point for trips to downtown and the trendy Old City neighborhood. You'll be just a block away from the chic shops of Market Square, five blocks from World's Fair Park, and a short ride on an Orange Line trolley from the University of Tennessee.

#### Hotel Parking

Valet Parking - Day Valet - \$20 /Daily

Valet parking is available 24 hours a day at a rate of \$35 per day with unlimited in and out privileges. Between 11:01pm and 6:59am, guests will be able to leave their keys with the front desk and coordinate parking.



#### Other Transportation

TRANSPORTATION CENTERS:

Knoxville Station: 0.3 mile

KAT Main Street Trolley Superstop: 0.4 mile

McGhee Tyson Airport (TYS): 13 miles

PUBLIC TRANSIT CENTERS:

Orange Line Trolley on Clinch Ave. » Access to the University of Tennessee, the University Commons, World's Fair Park

Green Line Trolley on S Gay St. » Access to Market Square, Old City

#### **Conference Fee and Catering**

The conference registration fee includes the following: Conference attendance, lunch and breaks each day of the conference, welcome reception Sunday, August 18, and excursion and dinner on Wednesday, August 21

We look forward to seeing you in Knoxville!

Note that a registration discount of \$200.00 is available for INTDS members. If you received your INTDS membership as part of the 2022 INTDS conference in Switzerland, you will need to renew your membership to be considered an active member for this conference. We are unable to include it as part of the conference fee. The renewed membership will be valid until the 2026 INTDS conference.

If you have not renewed or need to join the INTDS, please follow the link here: <u>https://www.intds.org/membership/</u>

Upon confirmation of your membership, we will provide a code to submit with your registration to receive the discounted conference rate.

#### Sponsor Registration is Open! Please follow the link: https://intds2024.ornl.gov/intds-sponsors/

Please reach out to <u>intds2024@ornl.gov</u> with any comments, questions, or suggestions regarding the conference or the registration process. We appreciate your support in our science and in this conference!

#### Opportunities for Sponsors and Exhibitors:

- · Gain quality exposure and meet decision makers in the rare isotope science domain,
- Participate in the definition of new research trends in rare isotope science technology,
- Establish relationships with leading and upcoming scientists and promote your business.

#### Promoter Level – USD 500

The company name and web link will be included on the conference "general information" and "exhibitor" web page. In addition, the company name will appear on conference publications (email announcements, abstract booklet, and final electronic distribution of conference talks).

#### Distributor Level – USD 700

In addition to the company name dispersal provided at the Promoter Level, the company is invited to provide product information for distribution in conference folders. Companies participating at this sponsorship level will assume all costs related with material reproduction and shipping to the conference organizers at least one week prior to the start of the conference.

#### Exhibitor Level – USD 1000

The company is invited to send up to two (2) representatives to exhibit products during the conference. The company will also receive the benefits listed above for the Distributor and Promoter levels.

#### Company Logos/Artwork

All exhibitors and sponsors are required to supply an electronic version of their logo (300dpi) for inclusion in the conference program and on the conference website (along with applicable signage). Sponsors will be contacted for graphics to be used in promotional materials and on the conference website once their full payment is received. Deadline for artwork submission will be announced later.



#### VACANCY NOTICE - 2024-GEE-GII5-FGIV-025364

#### Project Officer Science and Research

Type of contract	Member of the European Commission's contract staff, Function Group IV (article 3b of the <u>Conditions of</u> <u>Employment of Other Servants</u> )
Duration of contract	36 months (renewable up to maximum 6 years)
Area	Science and Research Neutron-induced reactions.
Place of employment	Geel (BE)
Indicative basic salary	3943,39 - 5711,77 € (applicable as of 1 <sup>st</sup> of January 2024) For more detailed information please consult: <u>Working</u> <u>Conditions</u>

#### WE ARE

The <u>Joint Research Centre (JRC)</u> provides independent, evidence-based knowledge and science, supporting EU policies to positively impact society.

The current vacancy is with Unit G.II.5 of Directorate G of the JRC.

The mission of the JRC's Directorate G - Nuclear Safety and Security is the implementation of the JRC Euratom Research and Training Programme, the JRC Nuclear Strategy and the maintenance and dissemination of nuclear competences in Europe to serve both "nuclear" and "non-nuclear" EU Member States. A strong cooperation and complementarity with their national organisations is of key relevance. JRC Directorate G supports the relevant policy DGs with independent, technical and scientific evidence in the areas of nuclear safety, security, safeguards and nuclear science applications. Directorate G also ensures the role of the JRC as an active key partner in nuclear international networks and collaborates with international organisations and prominent Academia and Research Institutes.

Unit G.II.5 provides high-quality reference nuclear data, measurement standards, sciencebased policy advice and training in support of EU policies for nuclear safety, security and safeguards. The unit cooperates closely with its stakeholders to maximise the benefits of deliverables, competences and research infrastructure: two accelerator-based neutron facilities, an underground laboratory, radionuclide metrology and nuclear reference materials laboratories. The unit offers open data and open access to its research infrastructure

The job holder will support the JRC experimental programme for neutron-induced reaction studies in the interest of nuclear science applications, in particular nuclear energy. The job holder will work at the electron linear accelerator based neutron time-of-flight laboratory.

We offer:

An attractive, dynamic, international work environment at the forefront of nuclear science and development in a world-renowned laboratory in its field. You will have frequent interactions with European and international stakeholders and will find the job an asset for a



further professional career. The job environment offers a unique opportunity to support EU policies in a family-friendly working environment. Please see also <u>Working at the</u> <u>Commission – conditions and environment (europa.eu)</u>

#### WE PROPOSE

The jobholder will support the JRC work program in nuclear safety through developing and carrying out experiments characterizing neutron-induced reactions at the GELINA neutron time-of-flight facility. The jobholder will work closely with the team of scientists at JRC and with the stakeholders of the JRC nuclear data program and in particular the users of the GELINA facility. The job holder will be a key contact person for member states research and development organisations developing and using nuclear data in their applications, open access partners and European and international collaborations of the OECD Nuclear Energy Agency and the IAEA. This is important for understanding data needs, prioritizing the experimental program and translating priorities to an effective and impact full nuclear data program. In particular we look for impact in modelling of applications in nuclear energy (life time extension, new built, spent nuclear fuel estimation and advanced and small modular reactors), nuclear technology and nuclear medicine.

#### WE LOOK FOR

We are looking for a well-motivated, dynamic, result-oriented PhD in Nuclear Physics or Nuclear Engineering with prior experience in experimental nuclear reaction studies or related experiments at a particle accelerator. Experience with neutron-induced studies, nuclear data or neutron and gamma transport simulations is an advantage. The jobholder should have good experimental skills, have a good ability to interact with users and colleagues and a good ability to deliver on time and be accountable. Experience with modelling of radiation detection, nuclear reactions (resonance shape analysis) and experimental setups for measurements of neutron-induced reactions with the GELINA accelerator is an advantage. Skills in training and transferring of knowledge and know-how are an advantage.

The job holder will go through targeted training, either following courses or on the job, to develop the skills that are missing.

The ability to learn quickly and develop is an important asset.

The working language is English, requiring mastering the language at level B2.

#### HOW TO APPLY

If you are already on a valid CAST FG IV reserve list, or you have already applied to one of the calls below, you can directly submit your application at <a href="http://recruitment.jrc.ec.europa.eu/?type=AX">http://recruitment.jrc.ec.europa.eu/?type=AX</a>.

If not, before applying to this position, you must register for one of the two following:

- the <u>Call for Expressions of Interest | EU Careers (europa.eu</u>) (CAST Permanent FG IV), which is used by a wide range of organisations (institutions, bodies, offices and agencies of the European Union), or
- the <u>specialised call for researchers</u> (JRC Call COM/1/2015/GFIV Research), which is mainly used by the JRC.



Note that each of the calls above has different minimum eligibility requirements and different selection tests.

The JRC cultivates a workplace based on respect for other people and the environment, and embraces non-discriminatory practices and equality of opportunity. In case of equal merit, preference will be given to the gender in minority.

Page 3 of 3



#### VACANCY NOTICE - 2024-GEE-GII5-FGIII-025386

#### FGIII - Laboratory Technician - Scientific and technical support officer – Technician supporting to nuclear science and laboratory safety

Type of contract	Member of the European Commission's contract staff, Function Group III (article 3b of the <u>Conditions of</u> <u>Employment of Other Servants</u> )
Duration of contract	36 months (renewable up to maximum 6 years)
Area	Scientific and technical support in nuclear science and laboratory safety
Place of employment	Geel (BE)
Indicative basic salary	3080,41 - 3943,38 € (applicable as of 1 <sup>st</sup> of January 2024) For more detailed information please consult: <u>Working</u> <u>Conditions</u>

#### WE ARE

The Joint Research Centre (JRC) provides independent, evidence-based knowledge and science, supporting EU policies to positively impact society.

The current vacancy is with Unit G.II.5 of Directorate G of the JRC: The mission of the JRC's Directorate G - Nuclear Safety and Security is the implementation of the JRC Euratom Research and Training Programme, the JRC Nuclear Strategy and the maintenance and dissemination of nuclear competences in Europe to serve both ' nuclear" and "non-nuclear" EU Member States. Unit GII.5 provides high-quality reference nuclear data, measurement standards, science- based policy advice and training in support of EU policies for nuclear safety, security and safeguards and nuclear science applications. The unit cooperates closely with its stakeholders to maximise the benefits of deliverables, competences and research infrastructure: two accelerator-based neutron facilities, an underground laboratory, radionuclide metrology and nuclear reference materials laboratories. The unit offers open data and open access to its research infrastructure.

The job holder will support activities in the nuclear and non-nuclear target preparation (thin layer samples and polyimide foils) laboratories. He/she will also assist in the technical implementation of the Periodic Safety Review (PSR). He/she will ensure maintenance and operation of scientific equipment and support laboratory housekeeping.

We offer:

An attractive, dynamic, international work environment at the forefront of nuclear science and development in a world-renowned laboratory in its field. You will have frequent interactions with European and international stakeholders. The job environment offers a unique opportunity to support EU policies in a respectful and family-friendly working environment.

Please see also Working at the Commission - conditions and environment (europa.eu)



#### WE PROPOSE

The successful candidate (job holder) will support the scientific work program of the JRC in nuclear safety. The job holder will design and carry out laboratory experiments for the preparation of targets (thin film deposits) for nuclear data measurements in line with the JRC's multi-annual work programme deliverables. The job holder will work in the JRC G.II.5 nuclear laboratories, prepare thin polyimide foils and other types of targets and samples and characterise them using spectrophotometric and other respective equipment and techniques. The job holder will provide the corresponding scientific and technical support to projects involving radiochemistry, thin film deposit and nuclear reference material development and characterisation within and outside a nuclear controlled area. The job holder will ensure proper housekeeping and the design, maintenance and operation of scientific/technical equipment in compliance with safety regulations. The job holder will further assist in the technical implementation of the Periodic Safety Review (PSR), waste management at laboratory level and provide support in liaising with the JRC Geel-site support service, the Health Physics Service and externals. The job holder will also assist in preparing procurement files and requests for quotations and purchases for scientific/technical equipment. The job holder will perform the work in close consultation with the team and the unit, serving the interests of the JRC and the JRC's stakeholders. The job holder will support the project planning and hands-on implementation of projects in the laboratory, including checking and evaluation of laboratory results. The job holder will assist in writing of technical reports and scientific publications, attend respective technical meetings.

#### WE LOOK FOR

We are looking for a well-motivated, dynamic, result-oriented technician, matching the following requirements:

- Educational background in chemistry (preferably in the field of inorganic or analytical chemistry), physics, material science or engineering with at least one year of experience working in a chemistry laboratory or similar.
- Experience working under a quality system is desirable.
- The successful candidate will have the potential to provide effective support to the JRC after one year of training and to support the full needs given in the job description within two years.
- Experience with and knowledge of laboratory practices in a (nuclear chemistry) laboratory or laboratory safety risk analysis is an advantage.
- Particularly, working in fume cupboards, glove boxes and thin film or sample preparation by various deposition, characterisation and analytical methods is an asset.
- Experience in operation of safety and administrative functions (chemicals, equipment, waste, infrastructure, procurement) in a laboratory environment is an asset.

The job holder will go through targeted training, either following courses or on the job, to develop the skills that are missing.

The ability to learn quickly and develop is an important asset.

The working language is English, requiring mastering the language at level B2.

The job holder will need to apply for security clearance.



#### HOW TO APPLY

If you are already on a valid CAST FG III reserve list, or you have already applied to the call below, you can directly submit your application at http://recruitment.jrc.ec.europa.eu/?type=AX.

If not, before applying to this position, you must register for:

 the <u>Call for Expressions of Interest | EU Careers (europa.eu)</u> (CAST Permanent FG III), which is used by a wide range of organisations (institutions, bodies, offices and agencies of the European Union)

The JRC cultivates a workplace based on respect for other people and the environment, and embraces non-discriminatory practices and equality of opportunity. In case of equal merit, preference will be given to the gender in minority.



## VACANCY NOTICE - 2024-GEE-GII5-FGIII-025387

#### FGIII - Laboratory Technician - Scientific and technical support officer – Technician for nuclear target and reference material preparation

Type of contract	Member of the European Commission's contract staff, Function Group III (article 3b of the <u>Conditions of</u> <u>Employment of Other Servants</u> )
Duration of contract	36 months (renewable up to maximum 6 years)
Area	Scientific and technical support in nuclear safety, security and safeguards
Place of employment	Geel (BE)
Indicative basic salary	3080,41 - 3943,38 € (applicable as of 1 <sup>st</sup> of January 2024) For more detailed information please consult: <u>Working</u> <u>Conditions</u>

#### WE ARE

The <u>Joint Research Centre (JRC)</u> provides independent, evidence-based knowledge and science, supporting EU policies to positively impact society.

The current vacancy is with Unit G.II.5 of Directorate G of the JRC: The mission of the JRC's Directorate G - Nuclear Safety and Security is the implementation of the JRC Euratom Research and Training Programme, the JRC Nuclear Strategy and the maintenance and dissemination of nuclear competences in Europe to serve both " nuclear" and "non-nuclear" EU Member States. Unit GII.5 provides high-quality reference nuclear data, measurement standards, science- based policy advice and training in support of EU policies for nuclear safety, security and safeguards and nuclear science applications. The unit cooperates closely with its stakeholders to maximise the benefits of deliverables, competences and research infrastructure: two accelerator-based neutron facilities, an underground laboratory, radionuclide metrology and nuclear reference materials laboratories. The unit offers open data and open access to its research infrastructure.

The job holder will design and carry out laboratory experiments for the preparation of nuclear targets (mainly thin layer samples on thin foils) and reference materials for inter-laboratory comparisons in the JRC.G.II.5 nuclear laboratories. The job holder will ensure maintenance and operation of scientific equipment and housekeeping in the nuclear controlled area.

We offer an attractive, dynamic, international work environment at the forefront of nuclear science and development in a world-renowned laboratory in its field. You will have frequent interactions with European and international stakeholders. The job environment offers a unique opportunity to support EU policies in a respectful and family-friendly working environment.

Please see also Working at the Commission - conditions and environment (europa.eu)



#### WE PROPOSE

The successful candidate (job holder) will support the scientific work program of the JRC in nuclear safety, security and safeguards. The job holder will design and carry out laboratory experiments for the preparation of nuclear targets for nuclear data measurements and for the preparation of reference materials for inter-laboratory comparisons under the unit's accreditation according to ISO 17025 and ISO 17043. The job holder will work in the JRC G.II.5 nuclear laboratories preparing, and characterizing thin homogeneous layers of enriched nuclear material and other samples for the measurements of constants critical for nuclear safety of current and advanced nuclear systems and for nuclear waste management. The job holder will provide the corresponding scientific and technical support to projects involving radiochemistry, thin film deposits and sample preparation and characterisation. All handling is done in fume cupboards and glove boxes in a nuclear controlled area according to the rules described in the JRC-Geel Radiation Protection Manual. The job holder will ensure proper housekeeping and the maintenance and operation of glove boxes, fume cupboards and scientific equipment in a nuclear controlled area in compliance with safety regulations. The job holder will perform the work in close consultation with the team and the unit, serving the interests of the JRC and the JRC's stakeholders. The job holder will support the project planning and hands-on implementation in the laboratory for the production and characterisation of nuclear targets and reference materials, including checking and evaluation of laboratory results. The job holder will assist in writing of technical reports and scientific publications, attend respective technical meetings. The jobholder will support the unit's integrated quality system.

#### WE LOOK FOR

We are looking for a well-motivated, dynamic, result-oriented technician, matching the following requirements:

- Educational background in chemistry (preferably in the field of inorganic or analytical chemistry), physics or material science with at least one year of experience working in a chemistry laboratory or similar.
- Experience working under a quality system is desirable.
- The successful candidate will have the potential to provide effective support to the JRC after one year of training and to support the full needs given in the job description within two years.
- Experience with and knowledge of laboratory practices in a (nuclear chemistry) laboratory is an advantage.
- Particularly, working in fume cupboards, glove boxes, dissolution of powders, purification of solutions and thin film preparation by various deposition methods is an asset.
- Further knowledge of characterisation techniques like accurate weighing, alpha-, gamma-spectrometry, electron microscopy, atomic force microscopy etc. is favourable.

The job holder will go through targeted training, either following courses or on the job, to develop the skills that are missing.

The ability to learn quickly and develop is an important asset.

The working language is English, requiring mastering the language at level B2.

The job holder will need to apply for security clearance.



#### HOW TO APPLY

If you are already on a valid CAST FG III reserve list, or you have already applied to the call below, you can directly submit your application at http://recruitment.jrc.ec.europa.eu/?type=AX.

If not, before applying to this position, you must register for:

 the <u>Call for Expressions of Interest | EU Careers (europa.eu)</u> (CAST Permanent FG III), which is used by a wide range of organisations (institutions, bodies, offices and agencies of the European Union)

The JRC cultivates a workplace based on respect for other people and the environment, and embraces non-discriminatory practices and equality of opportunity. In case of equal merit, preference will be given to the gender in minority.

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# Laughs for Target Makers

# When someone insults you by saying, that you have IQ of room temperature



For further information on the INTDS, please refer to our website: <u>www.intds.org</u>.