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IDEAAL

International Development of gAnil-spirAL2

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D5.1 - Information tools for industrial users

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*EXECUTIVE SUMMARY*

The WP5 Communication and Outreach supports the WP4 Innovation and industries objectives by providing efficient communication tools to potential and current industrial users and partners.

In this context, specific communication tools and actions were implemented by WP5 and 4 leaders. The objective of these actions is to make industrial companies aware of the potential for partnerships and of the possible use of GANIL-SPIRAL2 beams for their activities.

WP4 team participated in large conferences and exhibitions in 2017 and 2018, dedicated to nuclear public and private companies and to the development of industry / research collaborations. In this framework, posters, roll-up and printed documentation were created by WP5 and 4 teams as a support material for GANIL exhibition booth.

A section dedicated to industry was created on the new GANIL's website.

*INTRODUCTION*

As a support of WP4 actions, the WP5 team created new communications tools dedicated to industrial companies. The goal is to convince the industries of the interest of GANIL-SPIRAL2 facilities and potential partnerships in the development of their activities.

The topics to be highlighted in communications were confirmed by the market study provided by Erdyn innovation consulting company.

*COMMUNICATION TOOLS FOR CONFERENCES AND EXHIBITIONS*

The laboratory's valorization manager regularly participates in conferences and exhibitions which aim at bringing together research and industry players. In this context, GANIL's visibility and image are essential and must be supported by communication tools adapted to this target group.

WP5 team, in close contact with WP4 team, created posters to display in the GANIL's exhibition booth.

In 2017, three posters were created for the RADECS conference (<http://radecs2017.com/Radecs2017/index.php> October, 2-6).

The first poster (see Figure 1) was intended to promote the beam hours offered as part of the IDEAAL project, WP4. The poster presents the context of the call for proposals, the type of experiments expected, the number of hours offered and the scientific selection committee.

Two other posters were created to expose the industrial applications carried out with GANIL's ion beams, mainly for the irradiation of electronic devices.

The presentation brochure of the laboratory was offered to the participants, in which a sheet dedicated to industrial applications was inserted.

The poster dedicated to NUPIA workpackage (as part of ENSAR2 European Project) was displayed.



Figure 1: poster exhibited in GANIL's exhibition booth for the 2017 RADECS conference

In 2018, new posters were created for World Nuclear Exhibition (WNE - <https://www.world-nuclear-exhibition.com/fr/Accueil/>), RADECS conference (<http://radecs2018.org/>) and *Rendez-vous Carnot* conference (<https://www.rdv-carnot.com/>).

Concerning the WNE conference (June, 26 – 28), the GANIL stand was installed on the space reserved by Nucleopolis to gather all its members. A large sticker with GANIL was installed behind the GANIL area.

Since the space reserved for the GANIL display was limited, the valorization information was summarized on a single poster (see Figure 2).

The presentation brochure of the laboratory in which a sheet dedicated to industrial applications was inserted was offered to the participants.



*Figure 2: poster exhibited in GANIL's exhibition booth for the 2018 World Nuclear Exhibition*

Concerning the 2018 RADECS conference (September, 16-21), a set of two posters were displayed in GANIL's exhibition booth. The posters used for the previous RADECS conference were adapted to GANIL's graphic charter, which was elaborated in the framework of the IDEAL project. One poster was dedicated to the presentation of offered beamtime in the scope of WP4 and the second displayed information about industrial applications activities.

Finally, three posters in French were created for the Rendez-vous Carnot conference. As the valorization topics were better identified for this conference, they could be presented on a dedicated poster. Another poster presented the possible methods of valorization at GANIL. A third poster was created to present GANIL as a whole.

#### **POCKET AND SHEETS**

As a support to valorization activities development, it was necessary to create communication tools that could be distributed to industry representatives during exhibitions and conferences.

The sheets are included in a pocket. This solution will then make it possible to add new thematic sheets. In its first version, the pocket contains seven sheets.

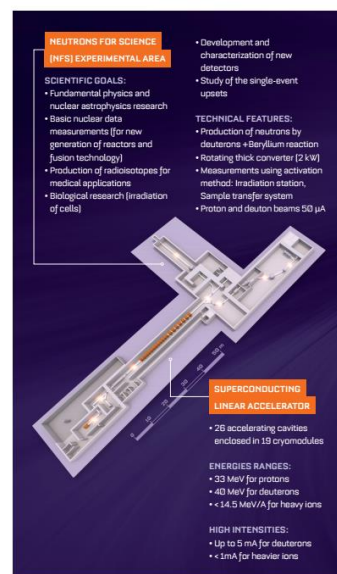
The first sheet includes information about GANIL facilities, accelerators, beamlines and experimental rooms. For each facility, available beams and intensities are exposed. The key figures are used to present the general description of the laboratory.

#### GANIL CYCLOTRONS COMPLEX



GANIL | Large national heavy ion accelerator | [www.ganil-spiral2.eu](http://www.ganil-spiral2.eu)

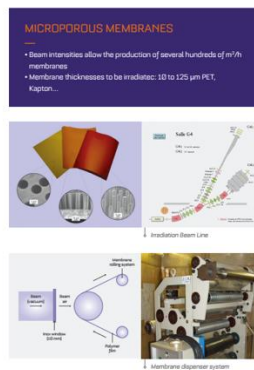
#### SPIRAL2 FACILITY



GANIL | Large national heavy ion accelerator | [www.ganil-spiral2.eu](http://www.ganil-spiral2.eu)

A second sheet presents the possible industrial applications with GANIL-SPIRAL2 facility, in particular for irradiation of electronic devices and production of microporous membranes with GANIL beams.

#### INDUSTRIAL APPLICATIONS WITH GANIL-SPIRAL2 FACILITY



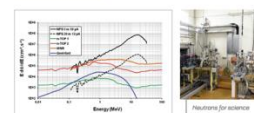
GANIL | Large national heavy ion accelerator | [www.ganil-spiral2.eu](http://www.ganil-spiral2.eu)

#### ELECTRONIC

##### GANIL Ion Beams mainly used for radiation tests

Ion	Energy (MeV)	LET (MeV/cm <sup>2</sup> )	Range (cm)	LET max (MeV/cm <sup>2</sup> )	Range (cm)
He <sup>+</sup>	27	5.4	440	9.8	133
Ne <sup>+</sup>	60	11.0	1070	42.1	27
Ar <sup>+</sup>	50	26.0	880	64.5	16
Fe <sup>+</sup>	20	72.7	358	97.6	6.4

##### SPIRAL2 Neutron Beams



- Neutron flux in the converter room at 5 cm downstream the converter higher than  $5 \cdot 10^{11}$  n/cm<sup>2</sup>/s with beryllium converter
- To be used to measure very small reaction cross-sections by activation technique, or irradiate very small samples (for instance)
- High-intensity flux (5 m)
- High-resolution measurements (30 m)
- Average neutron fluxes in the TSP area (5 m and 30 m) very competitive in comparison with other facilities like n-TOP at CERN, WNR at Los Alamos and DELUNA in Guel, in the 1-25 MeV energy range
- First experiments in NFS in 2021

GANIL | Large national heavy ion accelerator | [www.ganil-spiral2.eu](http://www.ganil-spiral2.eu)



Following the identification of know-how carried out as part of the workpackage 4, five specific sheets were created to present the current and potential GANIL's activities which can interest industry: ion beam diagnostics and control systems, ECR ion sources, vacuum technologies, mechanical manufacturing, development of accelerator based production of radioisotopes. For each sheet, a description of the activity, the dedicated permanent staff, the equipment and the valorization of current activities and potentialities are presented.



The printed version of these documents will be distributed at the innovation focus meetings organized by GANIL and Nucleopolis in February 2019 as well as during the next exhibitions and conferences in which GANIL will participate.

#### *DEDICATED SECTION ON GANIL'S WEBSITE*

As described in the Deliverable 5.3 of the IDEAAAL project, the best opportunity for GANIL was to have a unique website for all its targeted users, with a clear menu for navigation.

One of the section of the website presents the current and potential applications with GANIL ion beams, the available facilities and the conditions for access. The technical characteristics of the equipment are available in the form of separate technical data sheets.

Pages are dedicated to the main topics of valorization at GANIL. The sheets created for each topics are available online for more details.

#### *CONCLUSION*

The new communication tools developed and created as part of IDEAAAL workpackage 5 aim at supporting the development of valorization activities carried out by the WP4 team and by the facility as a whole.

In this context, printed and digital tools were developed to be used each time GANIL is in contact with current and potential industrial partners.

The solutions chosen for these tools will allow to evolve with the topics and projects to develop the valorization of GANIL-SPIRAL2 activities.