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The 10<sup>th</sup> International Conference  
**Channeling 2024**  
**Charged & Neutral Particles Channeling Phenomena**

Riccione (Rimini) - Italy

September 8 - 13, 2024

*organised by*

**Istituto Nazionale di Fisica Nucleare – Laboratori Nazionali di Frascati**  
**European Organization for Nuclear Research – CERN**

*under high sponsorship by*

**SIF – Italian Physical Society**

*in cooperation with and sponsored by*

**Sapienza University of Rome**

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**X Channel**

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The series of the International conference “Channeling – Charged & Neutral Particles Channeling Phenomena” organised by the Italian National Institute for Nuclear Physics (INFN) in collaboration with other world research facilities and research initiatives is devoted to the common discussion on advances in physics of coherent/incoherent interaction of relativistic and nonrelativistic hadrons and leptons (protons, ions, electrons, muons and related antiparticles) in strong electromagnetic fields of various origins and structures, from solid amorphous and crystalline, to laser and plasma based ones. Since the first meeting, the Channeling topics have been extended over the interaction of radiations and beams (wide broad electromagnetic radiations, atoms, and neutrons) in various structured media as well as meta-materials to be investigated at the channeling physics approach. Main present applications of the channeling physics relate to the future accelerators, storage rings and radiation optics projects. Channeling phenomenology can be applied to describe other mechanisms of interaction of both charged and neutral particle beams in external electromagnetic fields casing the research areas from crystal and capillary based accelerators, undulators, waveguides, and x-ray/neutron micro- and nano-optical elements.

The conference subjects cover basic theoretical and experimental research aspects together with several well-known techniques for applications in scientific instrumentation for large-scale experiments at famous accelerator centres as well as laboratory table-top studies. Last editions of the Channeling meetings are being organized by INFN together with CERN – the European Organization for Nuclear Research, and other famous research centres in Europe, Asia and America, where intense studies on interaction of relativistic particles interactions in crystals have been performing since long time.

The Channeling conference represents a special opportunity for a wide interdisciplinary community interested to know contemporary and future research in the field of relativistic/nonrelativistic beams, radiations interaction in solids as well as both radiations and beams propagation in micro- and nano-channel structures. These conference series are the milestone for the experts and young scientists looking for up-to-date investigations regarding the next generation of accelerators and photon sources, exploiting the opportunity not only to know but also to contribute to the latest

**Channeling 2024**

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international initiatives within related studies. To push and enhance at most the participation to Channeling 2024 the Committees strongly encourages the participation and presentations of young colleagues, postdocs, PhD students, postgraduate/undergraduate students.

The scientific program of Channeling 2024 will be composed of invited reports and lectures as well as oral and poster presentations and selected round tables. The organization of the event and the program will foresee and stimulate any kind of formal and informal discussion.

## @ Conference topics

- *coherent scattering of relativistic charged particles in strong fields*
- *crystal channeling, volume capture and volume reflection of hadron and lepton beams*
- *energetic ion interactions processes (backscattering and channeling of low energy ions, high energy ion channeling)*
- *electromagnetic radiation by relativistic charged particles in periodic structures (coherent bremsstrahlung, channeling radiation, transition radiation, diffraction radiation, parametric x-ray radiation, LPM effect, free electron lasers, Compton scattering, Cherenkov radiation-based phenomena, quantum coherence radiation phenomena)*
- *channeling of radiations in capillary systems (micro- and nano-channeling, micro-channel plates, nanotubes, nano-porous)*
- *novel techniques for beams handling and acceleration (channeling-based acceleration, plasma wake-fields, cross-laser fields, crystal assisted collimation, plasma-ion channels, capillary channeling)*
- *advanced x-ray and neutron optics (capillary/polycapillary optics, compound refractive optics, micro- and nano-focusing, beams and radiations waveguides)*
- *applications based on channeling phenomena (beams shaping, positron sources, powerful radiation sources, diagnostic tools, novel x-ray table-top instruments, channeling for advanced electronic materials studies, etc.)*

Channeling 2024 will host two satellite workshops:

- **Channeling Applications for FCC and other Future Accelerators**

*Recent studies have shown the feasibility of channeling phenomenology application for description of various mechanisms of interaction of charged and neutral particles beams in solids, plasmas, and electromagnetic fields. This workshop is dedicated to the discussion on common aspects of novel acceleration techniques as well as related phenomena and charged beams channeling within the main topics.*

- **Laser and Particle Guiding in Plasmas and Related Phenomena**

*The propagation of intense laser pulses or bunches of energetic charged particles in plasmas is often accompanied by the formation of channels of low electron density produced in the first case by the ponderomotive force and in the second case by the Coulomb repulsion. The formation of these channels, within which the transport of energy is facilitated, has important consequences in different fields of research, for instance, Controlled Thermonuclear Fusion, the acceleration of particles in plasmas and related secondary sources such as Thomson Scattering, Betatron and Transition Radiation.*



## @ International Advisory Committee

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## @ Organizing Committee

C. Curceanu, D. Hampai, G. Delle Monache, A. Marcelli, L. Marchitto, L. Porcelli

## @ Conference Secretaries

F. Casarin, L. Natoli

## @ Program, Abstracts, and Proceedings

**Program:** The scientific program of the conference will include invited presentations by the experts in the field of the Channeling 2024 topics, selected oral presentations, and poster sessions.

The conference will start with the **Channeling Primer** session together with the registration and followed at the end of the session by welcome mixer on **Sunday, September 8, afternoon** (Hotel Corallo & Comune di Riccione). The Primer session will include some formal greetings by the Organizers and sponsors of the conference.

On **Monday, September 9**, morning the **Scientific Program** will start at the Conference Hall of the Hotel Corallo and continue through the week with a mixture of oral and poster sessions as well as specialized round tables. The program will be concluded by the closing session on **Friday, September 13**. On **Wednesday, September 11** a morning session will be followed by the excursion. The conference dinner is planned on **Thursday, September 12 evening**.

**Abstracts:** Each author is requested for online submission of the abstract in English **by June 30, 2024**, a short online version together with the complete abstract for the Book of Abstracts (as a separate file attached) visiting the page **Abstract & Program**. The guidelines for Abstracts of Invited, Oral or Poster Contributions in doc, LaTeX (preferable) styles and the templates of these formats are online available via the related links on the page **Downloads & Dates** as well as a template sample at the end of this announcement. Please, save and upload the abstract under your family name typed in small letters, e.g. **abstract.smith.doc/tex** submitted by Dr. Smith.

Abstracts of all accepted papers, both oral and poster, will be published in the Advanced Program and in the Book of Abstracts, and distributed to all participants at registration.

**Proceedings:** The Channeling 2024 proceedings will be published as a special, but consecutively numbered, issue of the journal **Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment**. The contents of the Proceedings will consist of invited papers plus a selection of contributed papers.

1. The format, letter-type and layout will be the same as for the regular issues of the Journal. There will be no page charges, however, with possible length limitation (for a **regular paper to be preferably within 4 NIMA ready-printed pages**, while for an **invited one to be extended up to 6 NIMA ready-printed pages**). A manuscript should represent **original work not previously published** and not being considered for publication elsewhere.



- The Publisher requests the submission of the electronic version of the manuscripts. **On-line manuscripts' submission** via the Editorial Manager for NIMA Proceedings - [https://www2.cloud.editorialmanager.com/nima\\_proceedings/default2.aspx](https://www2.cloud.editorialmanager.com/nima_proceedings/default2.aspx) - will be required starting from **September 15, 2024**. The submission deadline of the first version of manuscript is **December 15, 2024**. **All manuscripts should be submitted before this date and the option to submit online via the submission system will be closed after that date.**
- In the meantime, the authors are kindly requested to have **the first drafts** of their manuscripts by **September 8, 2024**, to make necessary slight modifications after the conference.
- The authors are requested to select the correct article type when they submit their articles. When submitting the papers, the authors must select **"VSI: Channeling 2024"** as the article type. If the authors select the wrong article type, their paper may end up publishing in a regular issue and not in the special one.

For further information or questions, please, do not hesitate to contact the Organizing committee via e-mail: [channeling2024@lists.lnf.infn.it](mailto:channeling2024@lists.lnf.infn.it).

## @ Registration & Fee & Accommodation

Starting from **April 1, 2024**, participants are invited to register to the conference by filling in the online Registration Form (Indico). The details of your participation should be reported on the registration form to be evaluated by the Organizing Committee and conference secretaries.

Please, visit the official conference web site: <http://www.lnf.infn.it/conference/channeling2024>, which will be available for access from March 15, 2024.

The conference fee:

|                     | Early registration<br>/by July 15, 2024/ | Late registration<br>/since July 16, 2024/ | On-site registration<br>/September 8-13, 2024/ |
|---------------------|--|--|--|
| Regular             | 400 €                                    | 500 €                                      | 600 €  |
| Regular SIF-Member* | 350 €                                    | 450 €                                      | 550 €  |
| Student*            | 200 €                                    | 300 €                                      | 400 €  |
| Accompanying        | 100 €                                    | 100 €                                      | 100 €  |

includes the attendance of all conference sessions, technical and social, the publishing of the books of both abstracts and proceedings, etc. The advanced payment at earlier registration allows the participants to have a reduced registration fee (please, note that *the reduction depends on the period of payment and is split in two steps*); this payment should be done via either the bank transfer addressed to the bank account, or the online payment specified on the registration page.

\* Proof of the SIF membership should be sent together with the registration form. To become a SIF member, please, visit the web site of the Società Italiana di Fisica - <https://en.sif.it/membership>

\*\* Proof of the student status (a student card copy or a letter by supervisor) should accompany the registration form.

Simultaneously, a pdf copy of the bank transfer with a note **"Channeling 2024" Registration Fee - Last Name/Name** (together with the student card for students and/or the SIF certificate for members) should be sent to the Organizing Committee via e-mail [channeling2024@lists.lnf.infn.it](mailto:channeling2024@lists.lnf.infn.it).



The Organizing Committee will consider granting limited number of students or young researchers. The interested persons should specify their requests compiling the field “**Any other information or special requirements**” and submitting a “**Grant Application Form**” (available online on the page **Downloads & Dates** and presented at the end of the announcement).

Participants should arrange their own accommodation contacting the hotels directly quoting “**Channeling 2024**”. All necessary information on the booking procedure is online published; please, for details use the link **Lodging** at <http://www.lnf.infn.it/conference/channeling2024>, and if necessary do not hesitate to contact the conference secretaries.

### @ Important dates \*

|   |   |
|---|---|
| Abstract submission                               | by <b>June 30, 2024</b>   |
| Abstract acceptance                               | by <b>July 5, 2024</b>  |
| Hotel reservation                                 | by <b>July 15, 2024</b> (participants are requested to secure a room as soon as possible) |
| Registration:                                     |   |
| early   | by <b>July 15, 2024</b>   |
| late  | since <b>July 16</b> by <b>September 13, 2024</b>   |
| Application for Student/Young Scientist's support | by <b>May 31, 2024</b>  |
| Manuscript submission                             | since <b>September 15, 2024</b> by <b>December 15, 2024</b>                               |

\* Participants are invited to check periodically the update of the conference deadlines visiting the official web site.

### @ Conference Venue & How to get to the Conference

Channeling 2024 will take place in Riccione, the province of Rimini. Riccione is in the region of Rimini and makes a convenient base for travelers using public transport.

The **meeting venue for the period of September 8 - 13** the **Hotel Corallo** is placed in Riccione (Rimini) (Viale Gramsci 113 - 47838 Riccione (RN), Italy, phone: +39 0541 600807 - [info@corallohotel.com](mailto:info@corallohotel.com)). The conference hall, where all week working sessions will be held, is placed at the hotel.

The conference will start with the **Channeling Primer** session and followed at the end of the session by welcome mixer on **Sunday afternoon September 8** at the **Hotel Corallo**.

Riccione is on the Adriatic coast of Italy, the south part of Emilia Romagna between Rimini and Pesaro. Riccione is within easy reach of three main airports of Bologna, Rimini and Ancona-Falconara:

- “**Guglielmo Marconi**” International Airport, Via del Trionvirato, 84, Bologna - <https://www.bologna-airport.it/en> ;
- “**Federico Fellini**” International Airport, Via Flaminia, 409 – Miramare di Rimini (RN) - <http://riminiairport.com/en> ;
- “**Raffaello Sanzio**” International Airport, Piazzale Sandro Sordani, Falconara Marittima (AN) - <http://aeroporto Marche.regione.marche.it> .

Riccione can be reached by car via the **A14 motorway (Riccione exit)**. The A14 connects Riccione to the rest of Italy: it is easily reachable from Rome and the south, and also from the north by following the Bologna and Modena motorway interchanges. To see distances, travel costs and traffic conditions in real time, please, use the link



[www.autostrade.it](http://www.autostrade.it) . The railway station is downtown and links Riccione to all the other Italian cities and airports. Information are available on Trenitalia website [www.trenitalia.com](http://www.trenitalia.com) , or, for the international online timetables, [SBB CH railway company](http://SBBCH.railwaycompany) . If someone would like to use the taxi service, all necessary information about fares is available on the following website <https://www.taxi.it/riccione> or by phone call at +39 0541600559.

## @ Weather

Riccione is characterised by a semi-continental climate. Winters are quite cold, while summers are hot and sunny, a little stuffy but tempered by the breeze. Precipitations are equally distributed during the year, even though there is a maximum in autumn.

Humidity is high all year round, with a minimum of 72% in June and July and a maximum of 84% in November and December.

The best time to visit Riccione is from May until September, during this period, you will experience pleasant weather with a nice average temperature and limited rainfall. The highest average temperature in Riccione is 29°C in July and the lowest is 9°C in January. With a water temperature of around 22.0°C (71.6°F), the sea in Rimini is warm enough for swimming from July to September, while in June it is still a bit cool.

September in Riccione is the time of the velvet season. Italians are returning to the cities, but foreigners are taking their place. Therefore, the resort's beaches are still full of people. The heat is slowly receding, the temperature remains above +20 °C, which is quite comfortable, but at night it can be fresh, a sweater will be appropriate.

### Channeling 2024

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**@ Instructions to Authors of Abstracts for Oral or Poster Contributions:**

**The Title is Written in Bold, Times New Roman 12, Centered**

Author <sup>a</sup>, Author <sup>b</sup>: Times New Roman 12, centered

<sup>a</sup> Institute: Times New Roman 10, centered

<sup>b</sup> Institute: Times New Roman 10, centered

There must be one blank line between the title, the authors' names and their affiliation and two blank lines between the affiliation and the beginning of the body text without any punctuation mark at the end of these lines. Authors and affiliation must not exceed one line each. The name of the corresponding author is underlined.

All abstracts must be written in English and occupy a maximum of 1-page A4 written in Times New Roman 12, alignment in mode "justify". Please make sure to respect the following margins: top, bottom, right: 25 mm; left: 30 mm.

Reference citations [1] are shown in the text by a number in brackets and follow one double space below the body text under the heading "References".

No figures, images or photos have to be included in the abstract.

In order to ensure a smooth abstract booklet preparation, please do not insert text or references in "footnote" mode or other encoding.

**References**

1. The heading "References" follows one double space below the body text in Times New Roman 10 bold.
2. L.J. Marshal, and G. Talleni, Phys. Rev. A **43** (2001) 5897.



**GRANT APPLICATION FORM**  
/to be submitted by May 31, 2024/

|  |                    |
|--|--------------------|
| <i>Name</i>  |                    |
| <i>Mailing address</i>   |                    |
|  | <i>Phone</i>       |
|  | <i>E-mail</i>      |
| <i>Year of birth</i>   | <i>Nationality</i> |
| <i>Institute/University address &amp; Position of the applicant</i>                                      |                    |
| <i>Title of the contribution to Channeling 2024</i>  |                    |
| <i>Financial support by home institution/other organization for the participation in Channeling 2024</i> |                    |

Date:

Signature:

*Please send a copy of the completed Grant application form together with a recommendation letter of your supervisor or of some prominent scientist of your Institute/University **by May 31, 2024** to the Channeling 2024 secretariat via e-mail: [channeling2024@lists.lnf.infn.it](mailto:channeling2024@lists.lnf.infn.it).*