

SAPHIR NEWSLETTER



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RECENT NEWS

RECOMMENDED ARTICLE

The SND@LHC neutron shielding

Journal of Instrumentation, Volume 26, December 2025
Citation D. Abbaneo et al 2025 JINST 20 T12002
DOI 10.1088/1748-0221/2012/T12002

Abstract: This paper presents the design, construction, and simulation-based validation of the ColBox, a combined neutron shielding and insulating enclosure for the Scattering and Neutrino Detector at the LHC (SND@LHC). The emission films in the detector's target region require protection from the intense neutron radiation background and a stable environment of $15 \pm 1^\circ\text{C}$ and 50–65 % relative humidity for long-term stability. The ColBox meets these requirements through a dual-layer structure: an external 5 cm plexiglass wall to moderate fast neutrons, and an internal 4 cm layer of borated polyethylene (with 35 % boron content) to capture thermal neutrons. The mechanical design, based on a robust aluminum frame, accommodates the constraints of the T118 tunnel. FLUKA simulations were used to optimize the shielding configuration, showing a significant reduction in the neutron flux, with a simulated ratio of shielded to unshielded thermal neutron fluence of 2.3×10^{-3} . This result is consistent with initial measurements from BatMon detectors. The design also provides a sealed volume for a cooling system to maintain the required temperature and humidity, ensuring the necessary conditions for the emission films' integrity.

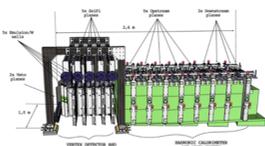


Figure 1. The SND@LHC detector.

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NEWS

"SAPHIR Millennium Institute Researcher Engages in Dialogue with Nobel Laureates on the Challenges of Particle Physics"

Marco Ajala, postdoctoral researcher at the SAPHIR Millennium Institute, took part in a fireside chat with Nobel Prize laureates in Physics Takaaki Kajita and Donna Strickland during the 2026 Global Young Scientists Summit in Singapore, reflecting on scientific motivation, the validation of discoveries, and the major future challenges of particle physics.



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"SAPHIR Strengthens Training in Particle Physics with the 'Particle Dark Matter Mini School 2025'"

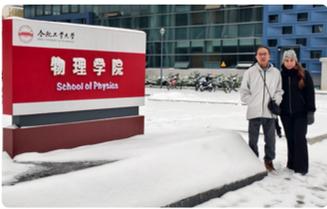
With strong participation and an outstanding scientific level, the SAPHIR Millennium Institute held the Particle Dark Matter Mini School, an intensive training initiative aimed at graduate students and early-career researchers interested in particle physics and dark matter. The activity was organized by **Bastían Díaz**, SAPHIR Early-Career Researcher, together with **Paulo Areyuna**, a doctoral student affiliated with the Institute.



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Giovanna Cottin, SAPHIR Researcher and UC Faculty Member, Strengthens International Projection in Particle Physics and Dark Matter through Scientific Agenda in the United Arab Emirates and Asia

Giovanna Cottin, researcher at the SAPHIR Millennium Institute and faculty member of the Institute of Physics at the Pontificia Universidad Católica de Chile, continues to consolidate the international presence of Chilean research in particle physics and dark matter following an intensive academic agenda recently carried out in the United Arab Emirates and Asia. During this period, she presented cutting-edge research results and strengthened strategic collaborations with leading international research centers.



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RECENT EVENTS

SAPHIR ARM 2026

SAPHIR Millennium Institute Held ARM 2026 at the Federico Santa María Technical University

The SAPHIR Millennium Institute held a new edition of its Annual Review Meeting (SAPHIR ARM 2026) on January 7 and 8, 2026, at the San Joaquín Campus of the Federico Santa María Technical University. The meeting reaffirmed its role as a key space for evaluation, scientific planning, and the strengthening of the institute's research community.



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CSC 2026 "The CERN School of Computing Was Inaugurated in Chile, the First Edition Ever Held in South America"

With an inaugural ceremony held at the Lo Costillar Campus of the Pontificia Universidad Católica de Chile, the CERN School of Computing – Latin America 2026 officially began. The school is organized by CERN in collaboration with the SAPHIR Millennium Institute and the Pontificia Universidad Católica de Chile. This edition represents a historic milestone, as it is the first time this prestigious training program has taken place in South America, positioning Chile as a regional hub for advanced education in scientific computing.

SAPHIR Millennium Institute Participates in Historic Agreement for the Development of High-Purity Copper with Codeco Ventanas Division

On January 28, representatives of Chile's Ministry of Science, Technology, Knowledge and Innovation, led by Minister Aldo Valle, took part in the signing of a Memorandum of Understanding (MoU) aimed at the development of ultra-high-purity copper at Codeco's Ventanas Division.

Representing the SAPHIR Millennium Institute, the agreement was signed by its Director, **Dr. Sergey Kuleshov**, Professor at the Faculty of Exact Sciences of Universidad Andrés Bello (UNAB), alongside authorities from the public, academic, and industrial sectors. The ceremony was also attended by **Dr. Gilberto Zamora**, Associate Researcher at the SAPHIR Millennium Institute and Professor at the Faculty of Exact Sciences of Universidad Andrés Bello, further highlighting the interinstitutional and academic significance of this milestone.



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COMMUNITY

"When Scientific Computing Brings the World Together: The CERN School of Computing Experience in Chile"

For two weeks, Santiago became a global meeting point for students and specialists from around the world at one of CERN's most prestigious schools. Organized jointly with the Pontificia Universidad Católica de Chile and the SAPHIR Millennium Institute, the initiative further consolidated Chile's position as a key player in international scientific training.



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OUTREACH

SAPHIR AT VOLCANO FEST 2026

On January 17 & 18, SAPHIR took part in "Volcano Fest", held at the National Museum of Natural History, located in "Quinta Normal" Park. During the event, hundreds of visitors stopped by the SAPHIR stand. The activity became a vibrant summer cultural hub, bringing science closer to the public through an engaging and festive atmosphere.



2026 SAPHIR SCHOLARSHIPS

2026 SAPHIR SCHOLARSHIPS

The SAPHIR Millennium Institute announces a call for master's and doctoral scholarships. Applications will be accepted from February 3 to March 5.

Scan the QR code to send the information and documentation

Eligibility Requirements:

- Applicants must provide proof of applications for the PhD Scholarships, including the application certificate.
- Applicants must provide proof of applications for the MSc Scholarships.
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