



Nuevas técnicas para el desarrollo de materiales mediante el uso de antimateria

Rafael Ferragut

Politecnico di Milano

<https://www.positron.fisi.polimi.it/>

Colaboraciones científicas Italia-Argentina



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Buenos Aires**

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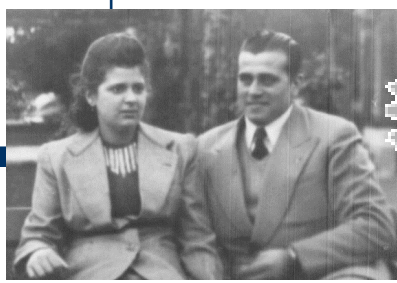
Rafael Ferragut (Associate Professor, PhD in Physics)

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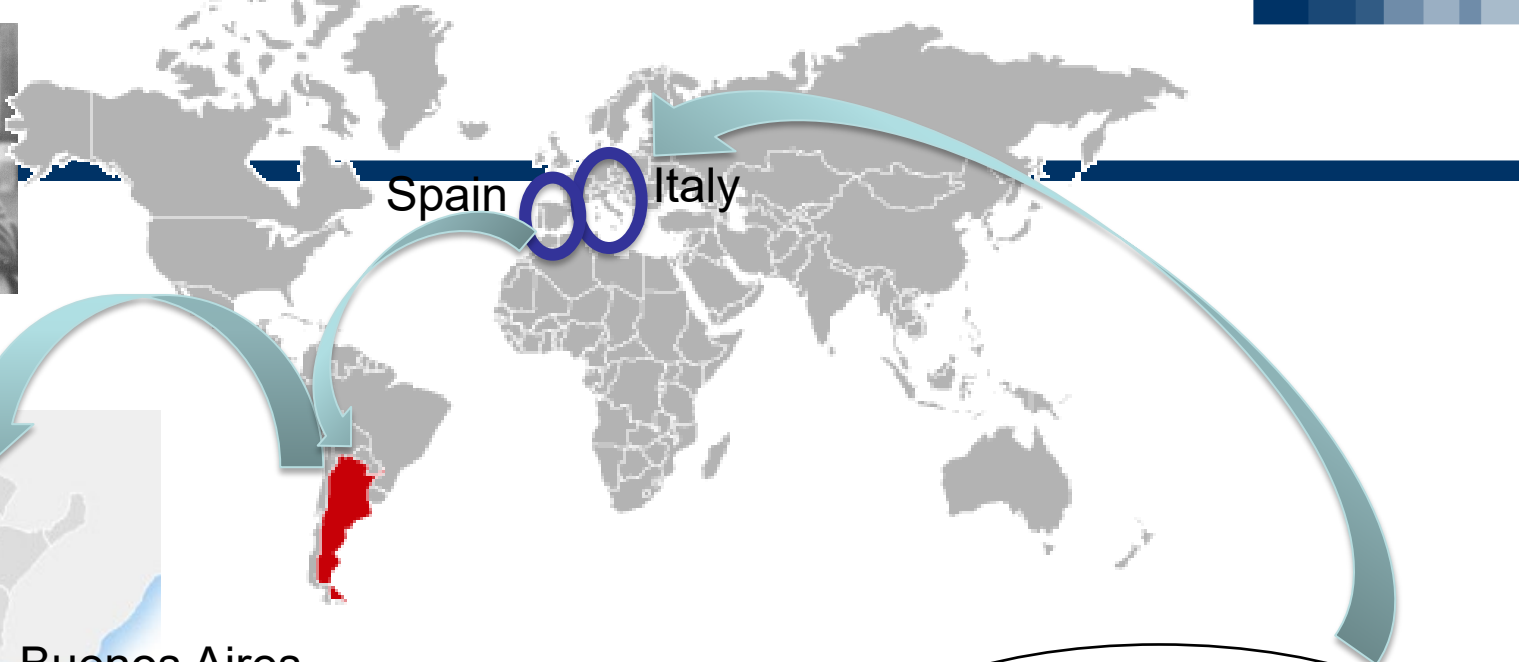
e-mail: rafael.ferragut@polimi.it

<https://www.positron.fisi.polimi.it/>

<https://www.fisi.polimi.it/en/staff/show/rafael-omar-ferragut--5737>



My parents



I moved to Italy in 2001
ICTP Post-doc position
(1-2 years)



UNICEN

Universidad Nacional del Centro de la Provincia de Buenos Aires

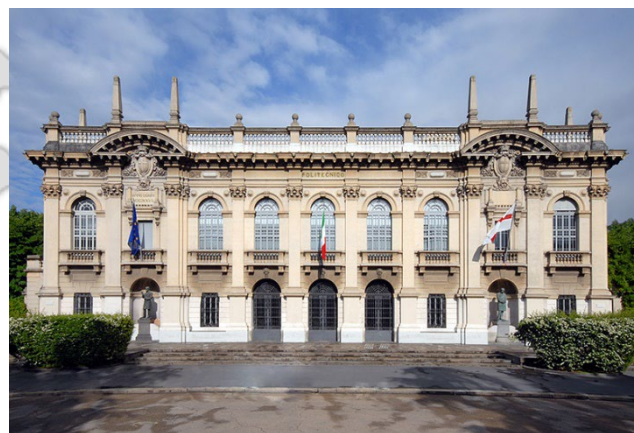




Como



Brunate



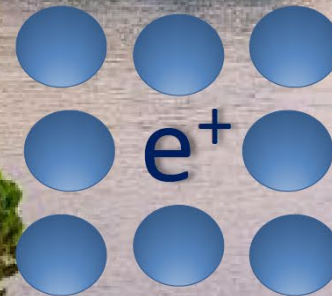
Alfredo Dupasquier

<https://aip.scitation.org/doi/pdf/10.1063/1.5135822>





PSD-24



**The International Workshop on
Positron Studies of Defects 2024**

PSD-24

September 1-6, 2024, Como, Italy



Location

Como – Italy

Sala Bianca del
Teatro Sociale



<https://www.psd-24.polimi.it/>



Laboratory

Positron Laboratory Politecnico di Milano – Department of Physics

<https://www.positron.fisi.polimi.it/>



Alfredo Dupasquier
(Laboratory founder)

1939-2015



- Home
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- Alfredo Dupasquier
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- Antimatter to build the future
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- PoliMI
- INFN



Positron Group, Politecnico di Milano

Students

Matteo Vicini
(PhD student)

Maying Zheng
(PhD student)

Xin Li
(PhD student)

Alberto Galanti
(Master student)

Matías Bayo
(PhD student)

Nicla Carbonetti
(Master student)



Rafael Ferragut
(Responsible -
Ass. Professor)



Paola Folegati
(Ass. Professor)

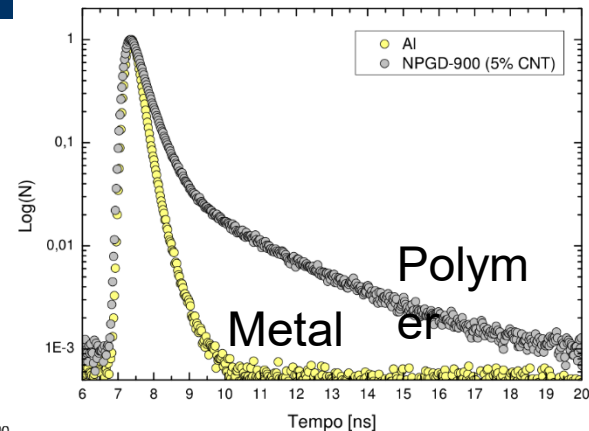
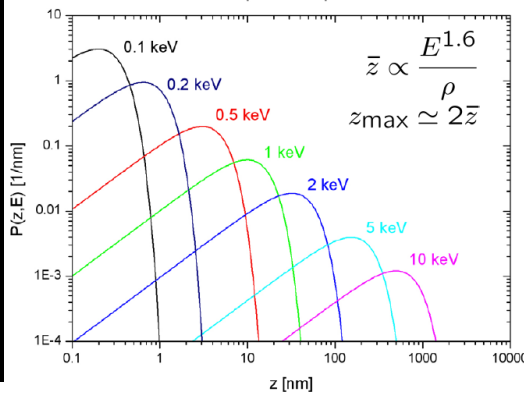
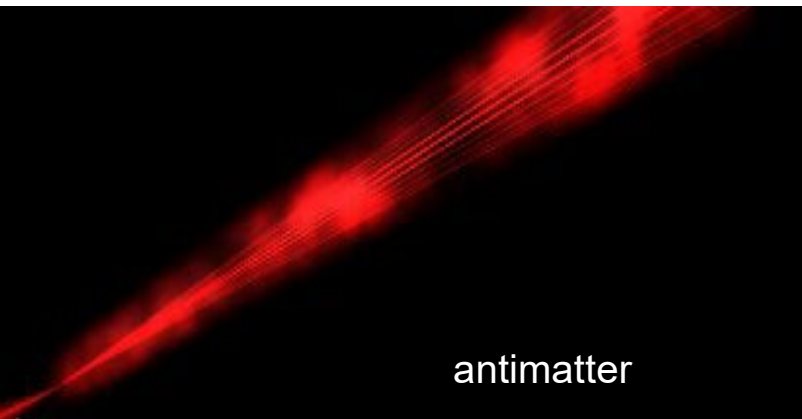


Marco Leone
(Technician)

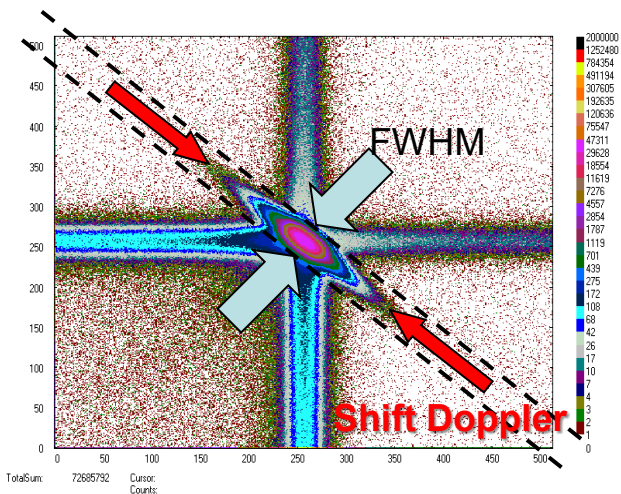
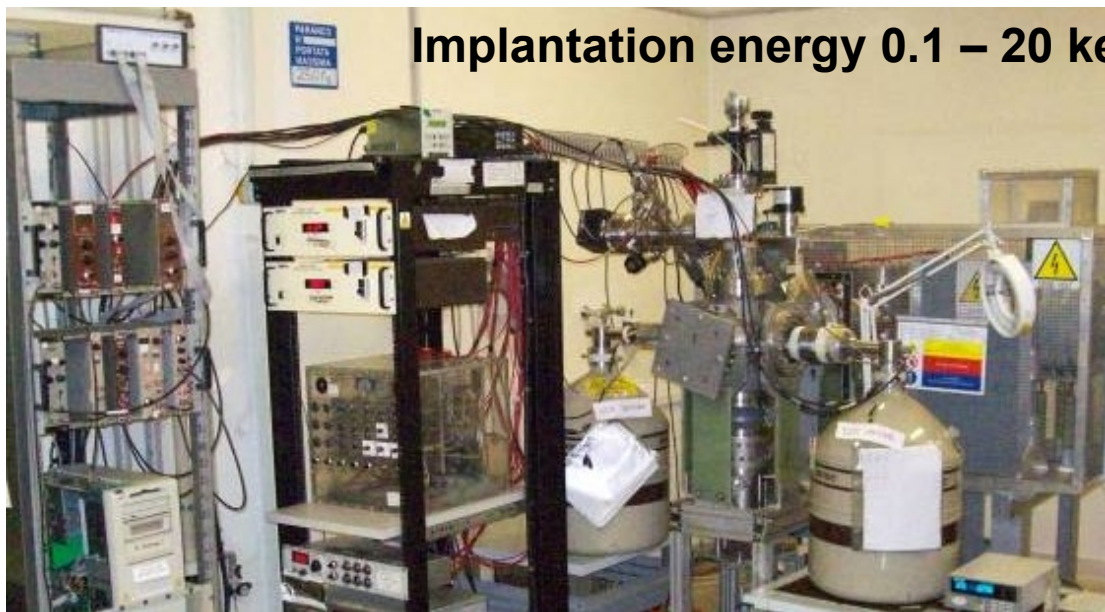
Riccardo Bini
(Technician)



Positron beam



Positron Lifetime Spectroscopy



Coincidence Doppler Broadening of the annihilation radiation



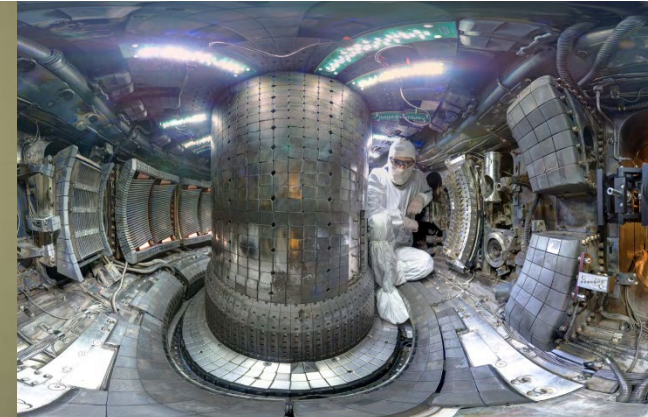
Variable Energy Positron Annihilation Spectroscopy



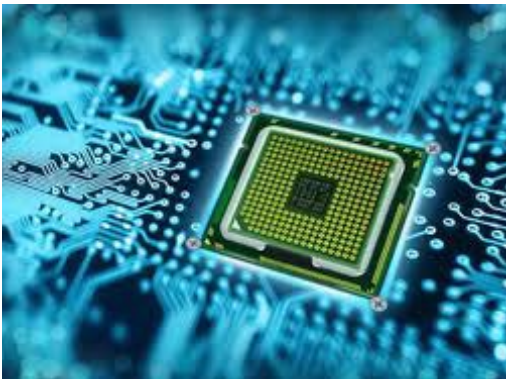
Light alloys



Polymers: contemporary art, membranes, nanometric brushes, etc.



Materials for a fusion reactor



Semiconductors

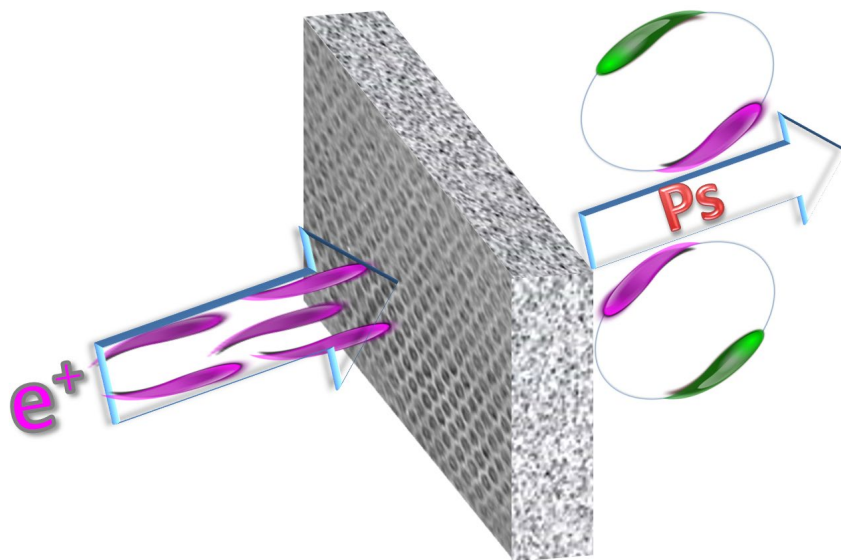


Oxides and perovskite

Other applications...



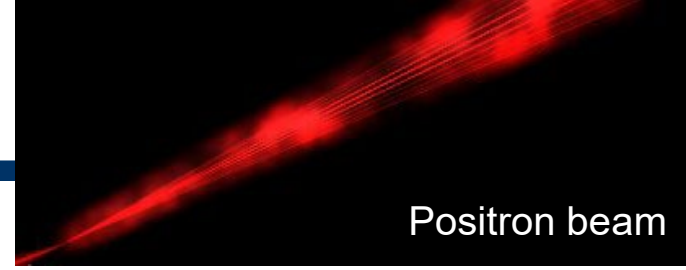
Positronium production in mesoporous materials



Chemical Society Reviews **42**, 3821 (2013) (I.F.: 46.2)

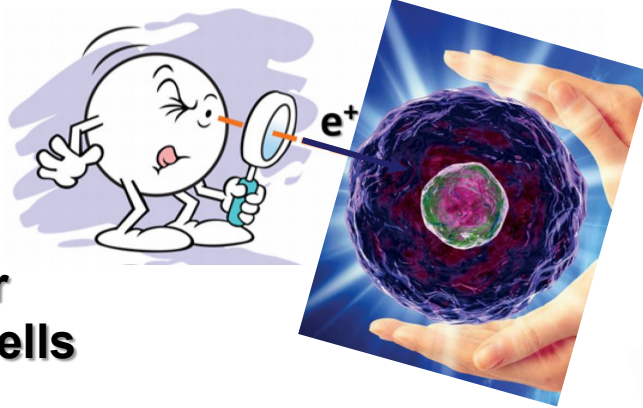
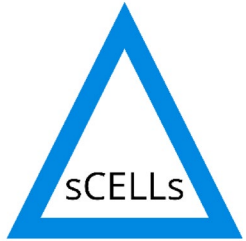


Variable Energy Positron Annihilation Spectroscopy



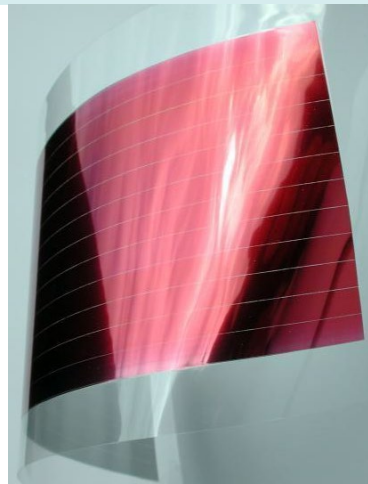
Positron beam

Interdisciplinary: Physics & Biology

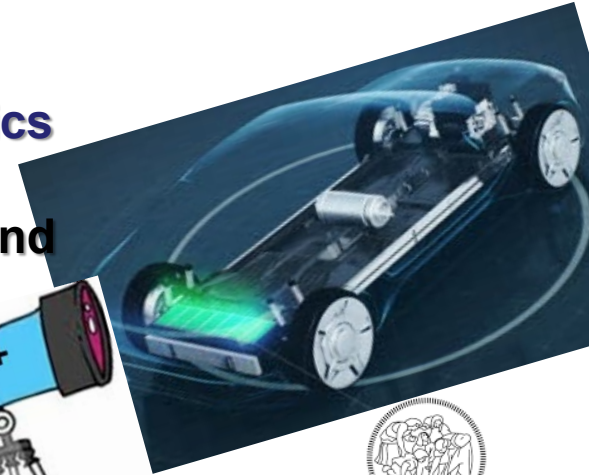


Antimatter In Single-Cells

Applied Physics Solar cells



Applied Physics Batteries (Ion Lithium and Sodium)



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UNIVERSITÀ DEGLI STUDI DI PADOVA



LUT University

Prof. Bernardo Barbiellini (LUT)

Prof. Rafael Ferragut & Mr. Valerio Toso

Prof. Vito Di Noto & Dr. Gioele Pagot (University of Padova)

Mr. Xin Li (new LUT-PoliMi PhD student) - start date May 1st/21

Miss Meiyong Zheng (CSC PhD student LUT-PoliMi) - start date November 1st/21

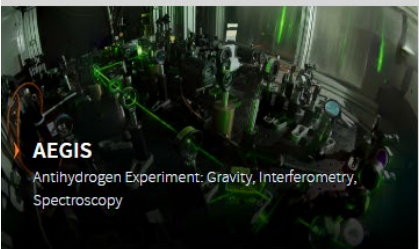




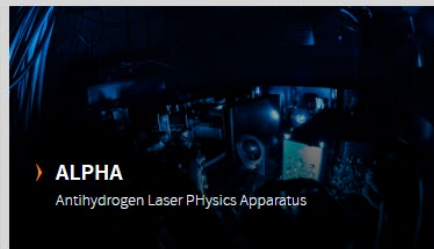
Antimatter activity at CERN

The Antiproton Decelerator

The Antiproton Decelerator (AD) is a unique machine that produces low-energy antiprotons for studies of antimatter, and "creates" antiatoms.



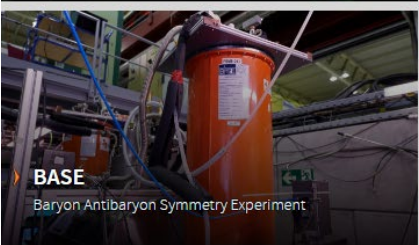
AEGIS
Antihydrogen Experiment: Gravity, Interferometry, Spectroscopy



ALPHA
Antihydrogen Laser Physics Apparatus



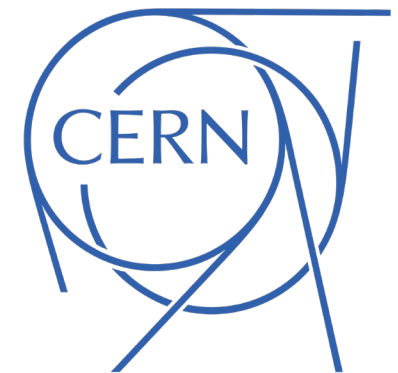
ASACUSA
Atomic Spectroscopy And Collisions Using Slow Antiprotons



BASE
Baryon Antibaryon Symmetry Experiment



GBAR
Gravitational Behaviour of Antimatter at Rest



LEA (Low Energy Antimatter)



ASACUSA
Atomic Spectroscopy And Collisions
Using Slow Antiprotons



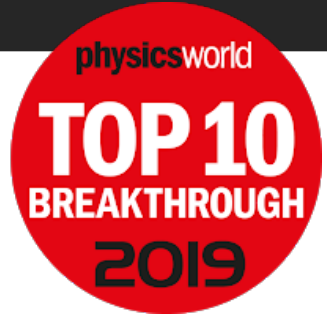
ASACUSA Collaboration Members (February 2020)

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T. Wolz¹², Y. Yamazaki³, and J. Zmeskal¹



SHARE

RESEARCH ARTICLE | PHYSICS



First demonstration of antimatter wave interferometry

S. Sala^{1,2}, A. Ariga³, A. Ereditato³, R. Ferragut^{4,2,*}, M. Giammarchi^{2,*}, M. Leone⁴, C. Pistillo^{3,*} and P. Scampoli^{3,5}

+ See all authors and affiliations

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Vol. 5, no. 5, eaav7610
DOI: 10.1126/sciadv.aav7610



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Istituto Nazionale
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u^b

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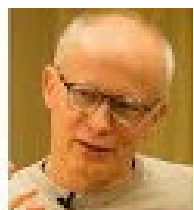
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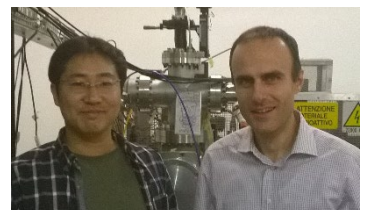
Rafael Ferragut



Simone Sala



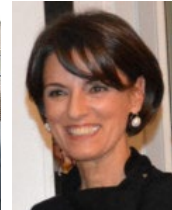
Marco Giammarchi



Aki Ariga Ciro Pistillo



Marco Leone



Paola Scampoli



Antonio Ereditato

Quantum Interferometry, decoherence and gravitational studies with Positrons and LASers



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National Institute for Nuclear
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New entries 2020/22

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Leonardo Salvi,

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Luca Venturelli,

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Stefano Migliorati *et al.*



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