Scientific Profile of Pierfrancesco Maltoni

1. Track of Records

Appointments (section 1)
- RTD_a (ssd chim/02) at Università di Genova (UNIGE), Dipartimento di Chimica e Chimica Industriale (DCCI)
-Postdoctoral Fellow (ssd chim/02) at Università di Genova (UNIGE), Dipartimento di Chimica e Chimica Industriale (DCCI)
- Associate Researcher at Consiglio Nazionale delle Ricerche (CNR), Istituto di Struttura della Materia (ISM)

Education, Academic responsibilities, and Awards (section 2-3-4-5)
- Member of Associazione Italiana di Magnetismo (AIMagn), 2020-at present
- Qualification Cultore di Materia (ssd chim/02)
- Member of the Centre for Neutron Scattering, Uppsala University, 2021-2023
- Representative for TNDR PhD council at Uppsala University, 2021-2023
- Chemical Safety Officer, Department of Materials Science and Engineering, Solid State Physics – Uppsala Universitet (Safety Responsible for Chemical Lab at Solid State Physics division), 06/2020-01/2023
- PhD degree, Department of Materials Science and Engineering, Solid State Physics – Uppsala Universitet, 08/12/2023
- Qualification Professional Chemist, first session 2019
- Master degree (cum laude) in Physical Chemistry, University of Firenze, 19/04/2019

Scientific Communication (section 6-7)
Co-author of 24 scientific communications
1 Invited talk personally given (International Conference)
1 Selected talk (International Symposium)
Co-author 13 Oral Communications (10 personally given).
Co-author of 10 Poster Communications (6 personally given).

Significant International experience (section 8)
2023 [2 months] Internship (C.M. Lerici grant) at Department of Chemistry and Industrial Chemistry - Università di Genova
2022 [2 months] Internship-Erasmus Staff at Universidad de Castilla-La Mancha/IRICA
2022 [6 month] Internship at Department of Chemistry and Industrial Chemistry - Università di Genova
2021 [1 month] Internship at Department of Chemistry and Industrial Chemistry – Università di Genova
2018-2019 [6 months] Internship-Erasmus Plus Traineeship at Lunds Universitet (Sweden)

Publications and citational profile (section 13)
18 papers (50% as first and/or corresponding author), 1 Report (ENEA), and 2 papers submitted in 2024.

Citational profile (updated 16/12/2024)
Google Scholar (number of citations 344; h- index: 9; h-10 index: 8)
Scopus (number of citations 287; h- index: 8)

Founded Projects (section 9)
Pierfrancesco Maltoni was granted on the following projects at international level. Main projects:
2024- 2027 VR International Postdoc [P:I: P. Maltoni; Total /Research Budget (%): 3.900.000/12%]
2023 C.M. Lerici grant [P.I.P. Maltoni; Total: 25.500 SEK]

Research Experiments at the Large-Scale Facilities (section 10)
-16 Nov. 2023 PETRA III, beamline P02.1 (P.I.)
-5 June. 2021 PETRA III, beamline P02.1 (P.I.)
-May 2009 ESTEEM3, TA Provider: IC-EM Krakow (Elecron Microscopy) (Main Proposer)

Scientific Evaluation activity (section 12)
- Referee for various scientific international journals.

Teaching Activity, Scientific divulgation and scientific supervision (14)
- Assistant Teacher in Solid State Physics I, Department of Materials Science and Engineering, Solid State Physics – Uppsala Universitet, 11/2019-12/2023
-Pierfrancesco Maltoni has been co-supervisor of **2 Bachelor** Student, **2 Master** Student.

1.Personal Data

Name	Pierfrancesco Maltoni
Place and date of birth	Firenze, April 20, 1994
Home Address	P.zza Rotonda n. 1 16131, Genova, (GE), Italy Private Mobile +39 331 500 67 43
Offices Address	Dipartimento di Chimica e Chimica Industriale (DCCI)- nM2-Lab Università di Genova Via Dodecaneso, 31 16146 Genova (GE) Istituto di Struttura della Materia (ISM)-nM2-Lab Consiglio Nazionale delle Ricerche Via Salaria Km. 29.300 00015 Monteorondo (RM)
e-mails	pierfrancesco.maltoni@edu.unige.it maltoni.pierfrancesco@gmail.com;
Nationality	Italian
Actual positions	**-** RTD_a (ssd chim/02) at Università di Genova (UNIGE), Dipartimento di Chimica e Chimica Industriale (DCCI) **-** Associate Researcher at Consiglio Nazionale delle Ricerche (CNR), Istituto di Struttura della Materia (ISM)

2.Appointments

01.11.24 – present	RTD_a (ssd chim/02) at Università di Genova (UNIGE), Dipartimento di Chimica e Chimica Industriale (DCCI)
01.11.23 –01.11.24	Postdoctoral Fellow (ssd chim/02) at Università di Genova (UNIGE), Dipartimento di Chimica e Chimica Industriale (DCCI)
01.01.20 – present	Associate Researcher at Consiglio Nazionale delle Ricerche (CNR), Istituto di Struttura della Materia (ISM)
Apr 2024-present	Qualification Cultore di Materia (ssd chim/02)

3.Education and Academic Qualifications

Dec. 2023 PhD in Solid State physics (Engineering Science) at Department of Materials Science and Engineering, Uppsala University
Thesis: Design, Synthesis and Characterization of Magnetic Ferrite Nanostructures

2019 Qualification (Esame di Abiitazione) for Professional Chemist

Apr. 2019 Degree in Chemical Sciences (LM54) - Chimica supramolecolare, dei materiali e dei nanosistemi 110/110 cum laude, at the University of Firenze

Thesis: Interaction of lamellar and non-lamellar lipid mesophases with inorganic nanoparticles.

4. Membership, Fellowship, and awards

Pierfrancesco Maltoni is member of Italian Chemical Society (Physical Chemistry Division), Italian Association of Magnetism (AIMAGN, European Association of magnetism (EMA) and European Society of Physics.

2024 PM has been awarded with Premio Miglior Tesi di Dottorato 2024 from Sezione Liguria-SCI

2022 PM has been awarded with Westmans, KG grant (Sweden)

2022 PM has been awarded with the prize for Best Poster Presentation from the ICFPM committee in Yokohama, Japan
Notes: The International Conference on Fine Particle Magnetism (ICFPM) is a series of conferences aimed at providing an international forum for discussion of the physics of these systems, their fundamental properties and underlying phenomena, developments in methods for their preparation and characterization, and their applications.

2022 PM has been awarded with Anna Maria Lundins travel grant (Spring Semester) for one week conference (ICFPM) in Yokohama, Japan

2022 PM has been awarded with the travel grant from the ICFPM committee in Yokohama, Japan.

2021-2023 PM has been Chair of the election committee of TNDR (Teknisk-naturvetenskapliga doktorandråde)- Manager of the periodic meetings of PhD students´ council at the Faculty of Science and Technology at Uppsala University

5.Training and courses

June 2024 Safety Course, Università di Genova (UNIGE), Dipartimento di Chimica e Chimica Industriale (DCCI), , Genova, Italy

Mar. 2024 HERCULES 2024, HERCULES school: neutrons & synchrotron radiation for science (1 month)
Notes: it is a five weeks course coordinated by the Université Grenoble Alpes (UGA). The school provides training for students, postdoctoral and senior scientists from European and non-European universities and laboratories, in the field of Neutrons, X-ray Synchrotron Radiation, and Free Electron Laser for condensed matter studies.

Nov. 2021 NNSP-SwedNess Neutron School 2021, Intro Course in Neutron Scattering (1 week)
Notes: it is a graduate school providing research training in neutron scattering and is operated by six Swedish universities.

Sep. 2021 ESM 2021, European School on Magnetism (1 week)
Notes: it aims at providing a thorough understanding of magnetism based on a broad series of fundamental lectures, while offering the latest insights into up-to-date aspects of magnetism with lectures focusing on a special topic. The topic covered in 2021 is From fundamental properties of matter to magnetic materials and applications.

Feb. 2020 Italian School on Magnetism, Rome, Italy (1 week)
Notes: it has been focused on basic principles of magnetism and magnetics thorough a broad series of fundamental lectures, while offering the latest insights into up-to-date aspects of magnetism and applications of magnetic materials.

6.Invited/Plenary Talks and lectures

July 2024 **Invited Talk** at 10th International Congress on Ceramics (ICC'10), July 14 – 19, Montreal, Canada, **P. Maltoni**, G. Barucca, B. Rutkowski, N. Yaacoub, G. Varvaro, J. De Toro, M. Vasilakaki, K. Trohidou, R. Mathieu, D. Peddis, *Tailoring Magnetic Properties in Superexchange-Coupled Nanocomposites: Insights from Monte Carlo Simulations and Spark Plasma Sintering.* **[01]**

7.Congress and Scientific Communications

Bold Presenting author

March 2024 First joint European MRS chapters workshop, March 19-22, 2024, Paris
Oral Communication P**. Maltoni,** G. Barucca, B. Rutkowski, J. Arbiol, M. Baričić, G. Varvaro, N. Yaacoub, R. Mathieu, D. Peddis, *Synthetic Approaches for Tailored Magnetic Nanocomposites* **[O12]**

Feb 2024 MAGNET2024 ▪ VIII ITALIAN CONFERENCE ON MAGNETISM, Sala Napoleonica, Istituto Lombardo Accademia di Scienze e Lettere, February 7 -9 2024, Milano, Italy
Oral Communication P.Maltoni, G.Barucca, M. C. Spadaro, B. Rutkowski, Petra E. Jönsson, N.Yaacoub5, J.A. De Toro, R.Mathieu, D. Peddis *From Ferrite Nanostructures to Sintered Dense Permanent Magnets* ; **[O11]**

Sept. 2023 XLIX National Congress of Physical Chemistry, September 4 – 7, Torino, Italy
Oral Communication P. Maltoni, G. Barucca, B. Rutkowski, N. Yacoub, J.A. De Toro, G. Varvaro, D. Peddis, R. Mathieu *From Ferrite Nanostructures to Sintered Bulk Permanent Magnets*. **[O9]**

June 2023 SCHOOL OF PHYSICAL CHEMISTRY 2023 (Frontiers in Materials Physical Chemistry: Nanostructures and Nanomaterials). Verbania (Italy) June 19 – 26, 2023.
Poster Communication *From Ferrite Nanostructures To Sintered Bulk Permanent Magnets*, **P.Maltoni**, G. Barucca, B. Rutkowski, N. Yacoub, J.A. De Toro, G. Varvaro, D. Peddis, R. Mathieu. **[P10]**

Oct 2022 11th International Conference on Fine Particle Magnetism (ICFPM2022), October 16 – 21, 2023 Yokohama, Japan
Oral Communication *Controlling the interphase coupling of magnetically hard-soft* $SrFe_{12}O_{19}$*-*$CoFe_2O_4$ *based nanocomposites,* **P. Maltoni**, G. Barucca, T. Sarkar, G. Varvaro, F. Locardi, M. Ferretti, D. Peddis, R. Mathieu. **[O8]**
Poster Communication *Novel seed-mediated sol-gel synthesis of* $Co_{1-x}Zn_xFe_2O_4$*-core/*$SrFe_{12}O_{19}$*–matrix bimagnetic nanocomposites,* **P. Maltoni**, M. Baričić, G. Barucca, D. Peddis, R. Mathieu.**[P9]**

Jul. 2022 XLVII Congresso Nazionale di Chimica Fisica - CNCF 2022, July 4-7 2022, genova, Italy
Oral Communication *Magnetic Interactions and Reversal Processes in Ferrites-Nanocomposites*, **P. Maltoni,** G. Varvaro, M. Abdolrahimi, P. E. Jönsson, D. Peddis, R. Mathieu **[O6]**

June 2022 Nanostructured Materials 2022 (NANO 22), June 06 – 10, 2022, Seville (Spain)
Oral Communication *Magnetic interactions in ferrites nanostructures*, **P. Maltoni**, G. Varvaro, M. Abdolrahimi, P. Jönsson, D. Peddis, R. Mathieu. **[O5]**

Jan. 2022 Joint MMM-INTERMAG, January 10-10, 2022, New Orleans (USA)
Oral Communication: *Optimizing magnetic properties and coupling of hard* $SrFe_{12}O_{19}$ *based nanocomposites*
P. Maltoni, G. Barucca, T. Sarkar, G. Varvaro, D. Peddis, R. Mathieu. **[O4]**

Aug. 2021 International Baltic Conference on Magnetism (IBCM) August 29 to September 2, 2021, Svetlogorsk , Kalingrad region , Russia.

Oral Communication *Optimizing the design of magnetically hard $SrFe_{12}O_{19}$ based nanocomposites*, **P. Maltoni**, G. Barucca, T. Sarkar, G. Varvaro, D. Peddis and R. Mathieu **[O3]**

June 2021 Advances in Magnetics -AIM 2021, June 13-16, 2021, Moena, Italy.
Oral Communication *Controlling magnetic coupling in hard-soft oxide nanocomposites* **P. Maltoni,** G. Barucca, T. Sarkar, G. Varvaro, D. Peddis, R. Mathieu**[O2]**
Oral Communication: *Morphology, structure, and magnetic coupling relationship in hard-soft $SrFe_{12}O_{19}$ and $CoFe_2O_4$ nanostructures* **P. Maltoni,** G. Barucca, T. Sarkar, G. Varvaro, F. Locardi, D. Peddis, R. Mathieu**[O1]**

Febr. 2021 The VII Italian Conference on Magnetism, February 11-12, 2021 (online event)
Poster Communication P. Maltoni, T. Sarkar, G. Barucca, G. Varvaro, D. Peddis, R. Mathieu *Designing magnetically coupled hard-soft nanocomposites.* **[P4]**

Apr. 2020 E-MRS 2020 Spring Meeting (online event)
Poster Communication: *Exploring the magnetic properties of Strontium-Hexaferrite Nanoparticles for the development of rare-earth-free Permanent Magnets* **P. Maltoni,** T. Sarkar, G. Barucca, G. Varvaro, D. Peddis, R. Mathieu **[P3]**

Feb. 2020 Super Fox Conference on Superconductivity and Functional Oxides (SUPERFOX), February10-12 2020 Santa Margherita Liguria, Italy.
Poster Communication: *Exploring the magnetic properties of Strontium-Hexaferrite Nanoparticles for the development of rare-earth-free Permanent Magnets*, **P. Maltoni**, G. Varvaro, G. Barucca, T. Sarkar, D. Peddis, Jose A. De Toro, R. Mathieu **[P2]**
Poster Communication: *Novel nanocomposites as energy-efficient permanent magnets* **P. Maltoni,** G. Varvaro, G. Barucca, T. Sarkar, D. Peddis, Jose A. De Toro, R. Mathieu **[P1]**

Co-author of scientific communications

Bold Presenting author

March 2024 First joint European MRS chapters workshop, March 19-22, 2024, Paris
Oral Communication N. Ghibaudo, P. Maltoni , T. Sarkar , M. Ferretti , S. Alberti ,D. Peddis, *$BiFeO_3$-based Systems used for Pollutants Piezo-photocatalytic Degradation in Wate*r. **[O13]**

Feb 2024 MAGNET2024 · VIII ITALIAN CONFERENCE ON MAGNETISM, Sala Napoleonica, Istituto Lombardo Accademia di Scienze e Lettere, February 7 -9 2024, Milano, Italy
Poster Communication N. Ghibaudo, P. Maltoni, T. Sarkar, **M. Ferretti**, S. Alberti, D. Peddis *BiFeO3-based Systems for Pollutants Degradation in Water: a Piezo-photocatalytic Approach*; **[P11]**

Sept. 2023 XLIX National Congress of Physical Chemistry, September 4 – 7, Torino, Italy
Oral Communication N. Ghibaudo, P. Maltoni, T. Sarkar, M. Ferretti, S. Alberti, D.Peddis, *Piezo-photocatalytic application of BiFeO3-based systems for pollutants degradation in water.* **[O10]**

Jul. 2022 XLVII Congresso Nazionale di Chimica Fisica - CNCF 2022, July 4-7 2022, genova, Italy
Oral Communication *Tuning the magnetic properties of spinel ferrite nanoparticles through chemical composition*, **M. Baricic**, P. Maltoni, A. Del Tedesco, G. Barucca, R. Mathieu, F. Canepa, D. Peddis **[O7]**

Apr.2022 Xth edition of the Franco-Italian Chemistry Days (JFIC2022), April 26-27, Toulon, France.
Poster Communication: *Synthesis of cobalt-iron nano-structured alloys by hydrogen annealing of spinel iron oxide nanoparticles*., **J. P. Miranda Murillo**, M. Abdolrahimi, A. Omelyanchik, P. Maltoni, F. M. Canepa, D. Colombara and D. Peddis **[P8]**

Sept. 2021 XXVII Congresso Nazionale Della Società Chimica Italiana - SCI2021, September 14-23 2021
Poster Communication P. Maltoni, G. Barucca, T. Sarkar, G. Varvaro, F. Locardi, M. Ferretti, D. **Peddis**, R. Mathieu, *Controlling the interphase coupling of magnetically hard-soft $SrFe_{12}O_{19}$-$CoFe_2O_4$ based nanocomposites*. **[P7]**
Poster Communication *Regulating the magnetic properties and interactions of spinel ferrite nanoparticles via elemental doping*., **M. Baricic**, P. Maltoni, A. Del Tedesco, G. Barucca, R. Mathieu, F. Canepa, D. Peddis, M. Ferretti. **[P6]**

Febr. 2021 The VII Italian Conference on Magnetism, February 11-12, 2021 [Virtual Event]
Poster Communication **M. Baricic**, A. Del Tedesco, G. Barucca, P. Maltoni, R. Mathieu, F. Canepa, *D. Peddis*, *Tuning the magnetic properties of spinel ferrite nanoparticles through chemical composition.* **[P5]**

8.Significant International experience

2023 [2 months] Internship (C.M. Lerici grant) at Department of Chemistry and Industrial Chemistry - Università di Genova
Main activities: Reduction Process of Ferrite-based Nanocomposites into Alloys for Permanent Magnets

2022 [2 months] Internship-Erasmus Staff at Universidad de Castilla-La Mancha/IRICA
Main activities: professional development in the scientific field of applied nanomagnetism; learn innovative laboratory techniques (gas-phase synthesis of alloy nanoparticles) and take part of new methods and tools in nanoparticles´ characterizations (advanced magnetometry); learn about new complex phenomena in magnetic nanoparticles (spin disorder, exchange-bias, spin-glass)

2022 [6 month] Internship at Department of Chemistry and Industrial Chemistry - Università di Genova
Main activities: Synthesis and Characterization of Metal alloys (FeCo, FeNi, Co, Fe) materials and nanoparticles

2021 [1 month] Internship at Department of Chemistry and Industrial Chemistry – Università di Genova
Main activities: Synthesis and Characterization of Magnetically Hard and Soft nanoparticles

2018-2019 [6 months] Internship-Erasmus Plus Traineeship at Lunds Universitet (Sweden)
Main activities: Preparation and characterization of oriented films from lipid liquid crystalline phases

9.Founded Projects

In this framework he has been personally responsible of :

2024 Research Grant: VR International Postdoc; *From Magnetic Nanoparticles to Superstructures: A Bottom-Up Strategy for Enhanced Material Functionality*; Guest Institution: IIT, Lunds Universitet; Period: 2024 – 2027; Total/Research Budget (%): 3.900.000 SEK/12%
Role: P.I.
Notes: link to spring call 2024

2023 Research Grant: C.M. Lerici Foundation; *Reduction Process of Ferrite-based Nanocomposites into Alloys for Permanent Magnets*; Guest Institution: Dipartimento di Chimica e Chimica Industriale, Universita` degli Studi di Genova; Period: June 2023 – July 2023; Budget: 25.500 SEK
Role: P.I.
Notes: link to foundation

10.Research Experiments at the Large Scale Facilities

16 Nov. 2023 PETRA III, beamline P02.1 (P.I.)
Beamtime I-20230103 (In-situ X-Ray synchrotron powder diffraction)
P.I. of *In situ characterization of the reduction process in ferrite-based nanocomposites*

5 June 2023 PETRA III, beamline P02.1 (P.I.)
Rapid Access-within the rapid access program 2021A under proposal ID RAt- 20010295 (X-Ray synchrotron powder diffraction)
P.I. of *Solving the crystal structure of Al^{3+} substituted $SrFe_{12}O_{19}$ ferrites*

May 2009 ESTEEM3, TA Provider: IC-EM Krakow (Elecron Microscopy)
Main proposer of *Effect of Al doping on structural, morphological and magnetic properties of $SrFe_{12}O_{19}$ based nanostructures* (Al_nanoSrFe12O19 project).

11. Conference and School Organization

June 2024 H-MAG, New Horizons on Nanostructured Magnetic Materials (H-MAG) workshop, Iglesias (Italy), June 27 – 29, 2024.
Notes: Appointed organizing committee and book of abstracts. ~50 participants. This was a satellite event of the International Conference on Magnetism (ICM) that was in Bologna June 30Th-July 5th.

July 2022 XLVII Congresso Nazionale di Chimica Fisica - CNCF 2022, Genova (Italy), July 4-7 2022.
Notes: Organizing committee and book of abstracts. ~ 230 participants

June 2022 NANO-22 – 16th International Conference on Nanostructured Materials, Sevilla (Spain), June 6 – 10, 2022
Notes: Appointed chair of session S4_10 - Frontiers in nanostructured magnetic materials Symposium.; The symposium with more than 70 participants has been the most numerous of the NANO22 conference.

12.Scientific Evaluation Activity

Referee for various scientific international journals: Journal of Magnetism and Magnetic Materials (Elsevier), Journal of Physical Chemistry (ACS), ACS Omega (ACS), Journal of Alloys and Compounds (Elsevier).

13. Scientific Publications and citational Profile

18 ISI papers (11 as first and/or last and/or corresponding author), 1 Report (ENEA), and 4 papers submitted in 2024.

Citational profile
Google Scholar (number of citations 344; h- index: 9; h-10 index: 8)
Scopus (number of citations 287; h- index: 8)

Collaboration: 90.9% International collaboration
Documents in top citation percentiles: 72.7% (Percent of documents in the top 25% most cited documents worldwide)

ORCID: Pierfrancesco Maltoni (0000-0001-9834-3164)

Publications Submitted (S) – In Preparation (IP)

S1) J. P. Miranda Murillo, A. Omelyanchik, G. Barucca, G. Varvaro, A. G. Haghighat, S. Laureti, A. Comite, D. Colombara, F. Canepa, **P. Maltoni, D. Peddis**, *Topochemical reduction from FeCo-oxide to FeCo-alloy nanosystems into a SiO_2 matrix: effect of the textural properties*

S2) **P. Maltoni**, G. Varvaro, N. Yaacoub, G. Barucca, D. Fiorani, R. Mathieu, A. Omelyanchik, **D. Peddis**, *Structural and magnetic properties of $CoFe_2O_4$ Nanoparticles in a a-Fe_2O_3 Matrix*

S3) M. Sedrpooshan, P. Maltoni, D. Peddis, A. M. Burke, M. E. Messing, **R. Westerström**, *Continuous Integration of 1D Magnetic Nanostructures for Soft Micro-Actuation*

Publications 2024

18) **P. Maltoni**, G. Barucca, B. Rutkowski, S. A. Ivanov, N. Yaacoub, A. Mikheenkova, G. Ek, M. Eriksson, B. Almqvist, M. Vasilakaki, G.Varvaro, T. Sarkar, J.A. De Toro, K. Trohidou**, D. Peddis, R. Mathieu**, *Engineering Hard Ferrite Composites by Combining Nanostructuring and Al^{3+} Substitution: from Nano to Dense Bulk Magnets*
doi.org/10.1016/j.actamat.2024.120491
Acta Materialia, 282, 120491 (**2025**) I.F. 2023: 8.3
Materials Science, Multidisciplinary: Q1 (2023)

17) **P. Maltoni**, **R. López-Martín**, E. H. Sánchez, P. S. Normile, M.Vasilakaki, Su Seong Lee, B. Santos Burgos, E. A. López del Castillo, D.Peddis, C. Binns, Kalliopi N. Trohidou, R. Mathieu, **J. Nogués**, **J.A. De Toro**, *Non-exchange bias hysteresis loop shifts in dense composites of soft-hard magnetic nanoparticles: New possibilities for simple reference layers in magnetic devices.*
doi.org/10.1007/s42114-024-00972-w
Adv Compos Hybrid Mater 7, 182 (**2024**) I.F. 2023: 23.2
Materials science, composites: Q1 (2023)
Nanoscience & nanotechnology: Q1 (2023)

16) **P. Pramanik**, F. Eder, M. Weil, S. A. Ivanov, P. Maltoni, R. Miletich, T. Edvinsson, **R. Mathieu**, *Vibrational properties of monoclinic $CoTeO_4$*
doi.org/10.1103/PhysRevB.110.054104
Physical review B, 110, 5 (**2024**) I.F. 2023: 3.2
Physics, applied: Q2 (2024)
Physics, condensed matter: Q2 (2023)

15) R. N. Dürr, P. Maltoni, H. Tian, S. Feng, S. Ghorai, P. Ström, C-W. Tai, R. B. Araujo, **T. Edvinsson,** *Clearing Up Discrepancies in 2D and 3D Nickel Molybdate Hydrate Structures*
doi.org/10.1021/acs.inorgchem.3c03261
Inorganic Chemistry, 5, 2388-2400 (**2024**) I.F. 2023: 4.3
Chemistry, inorganic & nuclear: Q1 (2023)

14) **M. Weil**, P. Pramanik, P. Maltoni, R. Clulow, A. Rydh, M. Wildner, P. Blaha, G. King, S. A. Ivanov, R. Mathieu, H. Singh**,** *$CoTeO_4$ – a wide-bandgap material adopting the dirutile structure type*
doi.org/10.1039/D3MA01106B
Mater. Adv., 5, 3001-3013 (**2024**) I.F. 2023: 5.2
Materials Science, Multidisciplinary: Q2 (2023)

13) **M. Baričić, P. Maltoni,** G. Barucca, N. Yaacoub, A. Omelyanchik, F. Canepa, R. Mathieu, **D. Peddis**, *Chemical engineering of cationic distribution in spinel ferrites nanoparticles: the effect on the magnetic properties*

doi.org/10.1039/D3CP06029B
Physical Chemistry Chemical Physics, 26, 7, 6325-6334 (**2024**) I.F. 2023: 2.9
Chemistry, physical: Q2 (2023)
Physics, atomic, molecular & chemical: Q2 (2023)

12) **P. Maltoni**, G. Barucca, B. Rutkowski, P. E. Jönsson, G. Varvaro, N. Yaacoub, J. A. De Toro, **D. Peddis**, **R. Mathieu**, *Unravelling Ferromagnetic Coupling in Ferrites Nano-heterostructures*
doi.org/10.1002/smll.202304152
Small, 2304152, pp11 (**2024)** I.F. 2023: 13.0
Chemistry, multidisciplinary: Q1 (2023)
Chemistry, physical: Q1 (2023)
Physics, applied: Q1 (2023)
Physics, condensed matter: Q1 (2023)

Publications 2023

11) M.Sedrpooshan, C. Bulbucan, P. Ternero, P. Maltoni, C. Preger, S. Finizio, D.Peddis, A.M. Burke, M. E. Messin, **R.Westerström**, *Template-Free Generation and Integration of Functional 1D Magnetic Nanostructures*,
DOI:10.1039/D3NR03878E
Nanoscale 15, 18500–18510 (**2023)** I.F. 2023: 5.3
Chemistry, multidisciplinary: Q1 (2023)
Materials science, multidisciplinary: Q1 (2023)
Physics, applied: Q1 (2023)
Nanoscience & nanotechnology: Q2 (2023)

10) **P. Maltoni**, M. Baričić, G. Barucca, M. C. Spadaro, J. Arbiol, N. Yaacoub, **D. Peddis** and **R. Mathieu** *Tunable particle-agglomeration and magnetic coupling in bi-magnetic nanocomposites*
DOI: 10.1039/D3CP03689H
Physical Chemistry Chemical Physics, 25, 27817-27828 (**2023)** I.F. 2023: 2.9
Chemistry, physical: Q2 (2023)
Physics, atomic, molecular & chemical: Q2 (2023)

9) **P. Maltoni**, G. Varvaro, M. Abdolrahimi, **D. Peddis**, and **R. Mathieu**, *Time and Temperature Dependent Magnetic Viscosity Experiments on Sr/Co Nanoferrite Particles*
DOI: 10.1063/5.0144701
Journal of Applied Physics 133, 163902 (**2023**) I.F. 2023: 2.7
Physics, applied: Q2 (2023)

Publications 2022

8) A. Omelyanchik, G. Varvaro, P. Maltoni, V. Rodionova, J.-P. Miranda Murillo, F. Locardi, M. Ferretti, C. Sangregorio, F.Canepa, P. Chernavsky, N. Perov, **D. Peddis,** *High-moment FeCo magnetic nanoparticles obtained by topo-chemical H2-reduction of Co-ferrite nanoparticles*
doi.org/10.3390/app12041899
Applied Science 12 (**2022**) I.F. 2022: 2.7
Physics, Applied: Q2 (2022);
Chemistry, Multidisciplinary: Q4 (2022)
Engineering, Multidisciplinary Q2 (2022)
Materials Science, Multidisciplinary: Q3 (2022)
Notes

This article belongs to the Special Issue *Advances in Magnetic Nanomaterials and Nanostructures.* Academic Editors Prof. Giorgio Concas and Dr. Franco Congiu (invited paper, waved fee)

7) L. Caselli, A. Ridolfi, G. Mangiapia, P. Maltoni, J. Moulin, D. Berti, N. Steinke, E. Gustafsson, **T. Nylander and C. Montis**, *Interaction of nanoparticles with lipid films: the role of symmetry and shape anisotropy*
doi.org/10.1039/D1CP03201A
Phys. Chem. Chem. Phys., 24, 2762-2776 (**2022**) I.F. 2022: 3.3
Chemistry, physical: Q2 (2022)

Publications 2021

6) **P. Maltoni**, S. A. Ivanov, G. Barucca,G. Varvaro, D. Peddis, **R. Mathieu**, *Complex correlations between microstructure and magnetic behavior in SrFe12O19 hexaferrite nanoparticles*
doi.org/10.1038/s41598-021-02782-2
Scientific Reports, 11, 23307, (**2021**) I.F. 2021: 4.996
Multidisciplinary Sciences: Q2 (2021)

5) R. N. Dürr, P. Maltoni, H. Tian, B. Jousselme, L. Hammarström, **T. Edvinsson**, *From $NiMoO_4$ to γ-NiOOH: Detecting the Active Catalyst Phase by Time Resolved in Situ and Operando Raman Spectroscopy*
doi.org/10.1021/acsnano.1c04126
ACS Nano, 15, 8, 13504 (**2021**) I.F. 2021: 18.027
Chemistry, Multidisciplinary: Q1 (2021)
Chemistry, Physical: Q1 (2021)
Materials science, multidisciplinary: Q1(2021)
Nanoscience & nanotechnology: Q1 (2021)

4) **P. Maltoni**, T. Sarkar, G. Barucca, G. Varvaro, **D. Peddis** and **R. Mathieu,** *Exploring the magnetic properties and magnetic coupling in Zn-doped $SrFe_{12}O_{19}/CoFe_2O_4$ nanocomposites*
doi.org/10.1016/j.jmmm.2021.168095
Journal of Magnetism and Magnetic Materials 535, 168095, (**2021**) I.F. 2021: 3.097
Physics, Condensed Matter: Q3 (2021);
Materials Science, Multidisciplinary: Q3 (2021)

3) **P. Maltoni,** T. Sarkar, G. Barucca, G. Varvaro**,** F Locardi**, D. Peddis** and **R. Mathieu,** *Tuning the magnetic properties of hard-soft SrFe12O19/CoFe2O4 nanostructures via composition/interphase coupling*
doi.org/10.1021/acs.jpcc.1c00355
Journal of Physical Chemistry C, 125, 10, 5927–5936, (**2021**) I.F. 2021: 4.177
Chemistry, Physical: Q2 (2021)
Materials Science, Multidisciplinary: Q2 (2021)
Nanoscience & Nanotechnology: Q3 (2021)

2) **P. Maltoni,** T. Sarkar, G. Varvaro, G. Barucca, Sergey A. Ivanov, **D.Peddis** and **R. Mathieu,** *Towards bi-magnetic nanocomposites as permanent magnets through the optimization of the synthesis and magnetic properties of $SrFe_{12}O_{19}$ nanocrystallites*
doi.org/10.1088/1361-6463/abd20d
Journal of Physics D: Applied Physics 54 124004, pp.10 (**2021**) I.F. 2021: 3.409
Physics, Applied: Q2 (2021)

Publications 2017

1) D. Tatini, F. Sarri, P. Maltoni, M. Ambrosi, E. Carretti, B. W. Ninham, **P. Lo Nostro** *Specific ion effects in polysaccharide dispersions*
doi.org/10.1016/j.carbpol.2017.05.078
Carbohydrate Polymers, 173, 344-352 (**2017**) I.F. 2017: 5.158
Chemistry, Applied: Q1 (2017)

14. Teaching Activity, Scientific divulgation and scientific supervision

Sep. 2019 – Dec. 2023 **Assistant Teacher** in Solid State Physics I course, at Department of Materials Science and Engineering, Solid State Physics – Uppsala Universitet, as part of the PhD program
Participants: ~100/semester

9 April 2024 **Seminar** UniGeSenior, Presidenza della Scuola di Scienze Matematiche, Fisiche e Naturali - Università di Genova
Lecture: **P. Maltoni, S. Slimani**, D. Peddis, *Magnetismo ed Energia: un Approccio Sostenibile*
Participants: ~50

Mar. 2024 **Seminar** at Design of Magnetic Nanoarchitectures-doctoral course, 2024, University of Genova, **P. Maltoni**, *Permanent magnets: a nanoparticle perspective*

15.Scientific Collaboration

- Dr. **R. Mathieu**, Department of Engineering Sciences, Uppsala University-Box Uppsala, Sweden
Topic: Equilibrium and Out-of-equilibrium dynamics of magnetic frustrated systems; AC magnetization Measurements
- **Dr. G. Barucca**, Università Politecnica delle Marche, Ancona, Italy.
Topic: Electron Microscopy and Nano-heterostructures.
-Dr. **Andreas Michels**, UniLu, Luxembourg
Topic: Micromagnetic Simulations and Neutron Scattering
- Prof. **J.A. de Toro**, UCLM, Ciudad Real, Spain
Topic: Interparticle interactions, Supermagnetism
- Dr. **J. Nogués**, ICREA, Barcellona, Spain
Topic: Exchange bias effects, Spin valves
- Dr. **C. Sangregorio**, ICCOM-CNR,
Topic: Magnetic nanoparticles for Permanent Magnets Applications
- **Prof. T. Edinsson**, Department of Engineering Sciences, Uppsala University-Box Uppsala, Sweden
Topic: Raman Spectroscopy and Water Splitting of Metal Oxides.
- **Dr. N. Yaacoub**, Universite' du Maine, Laboratoire de Physique de l'Etat Condense e UMR CNRS 6087, Le Mans, France.
Topic: Magnetic Structure of Nanoparticles; Mössbauer Spectroscopy
- Dr. M. Vasilakaki and **Prof. K. N. Trohidou**, IAMPPNM, Department of Materials Science, NCSR "Demokritos," Aghia Paraskevi, 15310 Athens, Greece
Topic: Monte Carlo Simulation.

16. Research Interest

PM's research focuses on the development and application of sustainable permanent magnets. The work emphasizes the synthesis, characterization, and optimization of magnetic materials, including rare-earth-free permanent magnets, ferrites, and other advanced magnetic alloys. A key area of interest is the self-assembly processes of magnetic nanoparticles and their role in creating high-performance magnetic materials. PM is dedicated to discovering sustainable alternatives to traditional rare-earth magnets by exploring abundant and environmentally friendly materials. The research delves into the magnetic properties of these materials, seeking to enhance their performance through innovative synthesis techniques and detailed characterization methods. By optimizing magnetic properties and stability, PM aims to develop efficient and sustainable permanent magnets.
Furthermore, PM explores potential applications of these magnets in renewable energy technologies, such as wind turbines and electric vehicles, and in advanced electronic devices. The goal is to address the

environmental and economic challenges associated with rare-earth magnet production, promoting a shift towards more sustainable and efficient magnetic materials. Through this work, PM aims to support the transition to a more sustainable and technologically advanced future by advancing the understanding and application of permanent magnets.

Scientific skills

- Extended experience on synthesis of nano-hetero-structures by chemical synthetic strategies: thermal decomposition, sol-gel, autocombustion sol-gel, hydrothermal/solvothermal synthesis in batch autoclave, co-precipitation. Experience on synthesis of magnetic alloy nanoparticles by Spark-Ablation has been also acquired.
- Fabrication of highly dense pellets by Spark Plasma Sintering (SPS) compaction method.
- Structural, morphological, and textural properties of magnetic nanoparticles and magnetic nanocomposites by X-Ray Diffraction, Neutron Powder Diffraction, Small Angle X-ray diffraction, Electron Microscopy, FT-IR spectroscopy, Thermal Analysis, Dynamic Light Scattering and UV-VIS spectroscopy.
- Magnetic properties of nanostructures (assemblies of magnetic nanoparticles, nanocomposites, nanochains) by AC and DC magnetic measurements (SQUID and VSM magnetometry).