EUROPEAN CURRICULUM VITAE FORMAT

Personal informations

Name	Filippo Peru
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Nationality	Italian
Date of birth	21 February 1989

Occupation

•Dates (from-to)	2019 – 2022
•Organization providing education and training/employer	Hydrogen Lab, Institute of Nanoscience & Nanotechnology, National Center for Scientific Research "Demokritos" under the supervision of Theodore Steriotis ENDURUNS - Development and demonstration of a long-endurance sea surveying autonomous unmanned vehicle with gliding capability powered by hydrogen fuel cell
•Principal subjects/occupational skills covered	Design, building and testing of the energy storage system of a prototype autonomous unmanned vehicle for seabed mapping and the associated surface unmanned vehicle.
•Dates (from-to)	2017 - 2019
•Organization providing education and training/employer	Hystore Tech Ltd in the framework of the Marie Curie Project ATLAS-MHC – Advanced metal hydride hydrogen compressors – Pilot development and market penetration. Under the supervision of Prof. George Karagiorgis and Prof. Christodoulos Christodoulou.
•Principal subjects/occupational skills covered	Up-scaling the laboratory prototype metal-hydride compressor (MHC) for hydrogen compression to pressures higher than 300bar -Hydrogen sorption tests on several metal alloys of AB2 [(Ti,Zr)(Ni,Cr,Co,Mn,Fe,V)2] and AB5 [(La,Ce)Ni5] type. -Mechanical grinding of metal hydrides. -Building a fully functional metal hydride compressor. -Testing and performance evaluation of the compressor. Side occupations: -Set up and testing of a commercial Hydrogen Fuel Cell – Electricity inverter – Electrical Grid system. -Basic training on LabView use for data acquisition and control (October 2018).

•Dates (from-to) •Organization providing education and training	2014 - 2017 -National and Kapodistrian University of Athens - Hydrogen Lab, Institute of Nanoscience & Nanotechnology, National Center for Scientific Research "Demokritos" under the supervision of Theodore Steriotis - Marie Curie ITN ECOSTORE – "Novel Complex Metal Hydrides for Efficient and Compact Storage of Renewable Energy and Electricity"
•Principal subjects/occupational skills covered	Thesis Title: Development of novel carbon/complex hydrides and amides nanocomposites for hydrogen storage applications Aims of the project: -Study and synthesis of new porous materials based on carbon -Study and synthesis of carbon/complex hydrides-amides nanocomposite for hydrogen storage -Study and synthesis of carbon/complex borohydrides nanocomposites for hydrogen storage Techniques and instruments used: -Synthesys of the porous (silica, carbon, resin) materials: general chemistry techniques, solvothermal, hard templating and EISA -Treatment of the hydrides/complexes: Argon filled Glove Box, Ball milling, high temperature and pressure stainless steel reactors, melt infiltration techniques Materials characterization: N2 adsorption/desorption, X-Ray diffraction, in situ synchrotron experiments, Temperature Programmed Desorption experiments, Mass Spectrometer, hydrogen storage volumetric measurements (using a Sievert-type apparatus), in situ experiments Raman spectroscopy Scientific training: -Ecostore Training Workshop 1 (TW1), 5 - 9 May 2014 at Helmholtz-Zentrum Geesthacht, Germany -Ecostore Training Workshop 2 (TW2), 6 - 10 October 2014 at Aarhus University, Denmark -Ecostore Training Workshop 3 (TW3), 2 - 6 February 2015 at Villaggio Olimpico in Bardonecchia, Italy -Ecostore Young Researchers Workshop, 5 - 6 March 2015 in I2CNER, Kyushu University in Fukuoka, Kyushu -Ecostore Training Workshop 4 (TW4), 5 - 9 October 2015 at CNRS, France -Ecostore Training Workshop 5 (TW5), 25 - 29 April 2016 at IFE, Norway -Ecostore Excursion to Rockwood Lithium, 5 - 7 September at Energiepark Mainz, RWLi R&D, Industrepark Höchst, Langelsheim Plant -Ecostore Training Workshop 6 (TW6), 12 - 16 October 2016 at UoB, United Kingdom -Ecostore Training Workshop 7 (TW7), 3-7 April at SAFT, Bordeaux, France

•Dates (from-to) •Organization providing education and training	2011- 2014 University of Sassari, Department of Chemistry and Pharmacy, Via Vienna, 07100, Sassari, Italy
•Principal subjects/occupational skills covered	Degree in Chemical Sciences (two years duration) consisting in inorganic chemistry, analytical chemistry, organic chemistry, polymers and industrial chemistry, physical chemistry, bioinorganic chemistry, spectroscopy and structural chemistry, material chemistry for energy conversion and storage, Nanochemistry, Heterogeneous Catalysis. Laurea Magistrale (Master degree) **110/110**. Supervised by Prof. Gabriele Mulas and Dr. Sebastiano Garroni, defended the 11th of April 2014. Master's Degree Thesis, titled "Synthesis and structural and morphological characterization of new C-N-Fe composite materials as electrodes for PEMFC". The thesis work was focused on the synthesis and characterization of innovative electrode materials for oxygen reduction reaction "ORR" in low-temperature fuel cells. The work was focused on noble metal-free electrodes based on porous CMK-3 carbons N-doped activated by Iron.
•Dates (from-to) •Organization providing education and training	2008-2011 University of Sassari, Department of Chemistry and Pharmacy, Via Vienna, 07100, Sassari, Italy
•Principal subjects/occupational skills covered	Degree in Chemistry (three years duration), consisting in basics of mathematics, physics, inorganic chemistry, analytical chemistry, organic chemistry, polymers chemistry, biochemistry and physical chemistry Laurea Triennale (Bachelor's degree) **110/110**. Supervised by Prof. Gabriele Mulas and Dr. Sebastiano Garroni, defended the 14th October 2011. Bachelor's Degree Thesis, titled "Synthesis and Characterization of mesoporous matrices for the nanoconfinement of complex hydrides The thesis work was focused on a first part on -the synthesis of the highly-ordered mesoporous silica (SBA-15) and its carbon replica (CMK-3) -The nanoconfinement of NaBH4 through wet chemistry techniques and inert atmosphere (Shlenk line, glove box) -Characterization of the materials The results have been presented on an International Conference (MH2012-Kyoto) and then published on a special issue of the Journal of Alloys and Compounds. In a second part of the thesis work, other materials were prepared as a scaffold. For example, mesoporous MgO and MgxNbxOx were synthesized via EISA (Evaporation Induced Self Assembly) method at low controlled temperature in air atmosphere.

Personal skills and competences	-Synthesis and characterization of mesoporous materials by EISA, soft and hard template methods for energy storage or catalysis. -Preparation of nanostructured materials for solid-state hydrogen storage by infiltration of mesoporous matrices. Investigation on the thermodynamic and kinetics properties of the complex hydrides and metal hydrides. -Surface analyses: measurements of specific surface area by nitrogen physisorption according to B.E.T. method -X-ray diffraction. -Preparation of nanostructured materials for solid-state hydrogen storage applications by high-energy ball milling. Investigation on the thermodynamic and kinetics properties of the complex hydrides and metal hydrides. -Synthesis of powders and control of solid-solid reactions by ball milling processes under controlled atmosphere. -Synthesis of powders and control of gas-solid reactions by high pressure-high temperature reactor. -Characterization with spectroscopic techniques: IR, Raman. -Evaluation of thermal properties and stability TPD-MS, TGA, DSC. -Evaluation of the ab-desorption properties in hydrogen storage functional materials by Sievert type apparatus. -Use of common software for text editing and data elaboration sustained in windows environment: word, excel, PowerPoint and PDF. Use of graphics applicative software like Origin, Excel, Chemdraw, etc. Use of image's editing softwares (Photoshop). -Knowledge about functioning and construction of a metal hydride compressor -Knowledge of 3D modelling software Solidworks 2022
Scientific pubblications	**F. Peru**, S. Payandeh, G. Charalambopoulou, Torben R. Jensen, T. A. Steriotis, Hydrogen Sorption and Reversibility of the $LiBH_4$-KBH_4 Eutectic System Confined in a CMK-3 Type Carbon via Melt Infiltration, C, 6(2) 2020, 19 E. Hadjixenophontos, E.M. Dematteis, N. Berti,A.R. Wołczyk,P. Huen,M. Brighi, T.T. Le, A. Santoru, S. Payandeh, **F. Peru**, A.H. Dao, Y. Liu, M. Heere. A review of the MSCA ITN ECOSTORE - Novel complex metal hydrides for efficient and compact storage of renewable energy as hydrogen and electricity, Inorganics 8 (3) 2020 **F. Peru**, S. Garroni, R. Campesi, C. Milanese, A. Marini, E. Pellicer, M.D. Baró, G. Mulas, Ammonia-free infiltration of NaBH4 into highly-ordered mesoporous silica and carbon matrices for hydrogen storage, Journal of Alloys and Compounds 580, 2013 S309–S312 P. Huen, **F. Peru**, G. Charalambopoulou, T. A. Steriotis, Torben R. Jensen, and D. B. Ravnsbæk. Nanoconfined NaAlH4 Conversion Electrodes for Li Batteries, ACS Omega, 2 (5) 2017, pp 1956–1967

Presentations in international conferences	1-2/11/2018 – 6th International conference on renewable energy sources & energy efficiency (Nicosia, Cy) Contribution: Metal Hydride Compressor (MHC) for Hydrogen Compression to Pressures of more than 300bar. Chris N. Christodoulou, G. N. Karagiorgis, G. Tzamalis, D. P. Hadjipetrou, K. G. Deligiannis, M. Odysseos, **F. Peru**, M. Senholdt, V. Analytis, E. Stamatakis and A. Stubos 18-21/9/2017 – E-MRS 2017 Fall Meeting (Warsaw, PL) Talk: Desorption and cycling properties of pore infiltrated $LiBH_4/KBH_4$. **F.Peru**, S. Payandeh GharibDoust, T.R. Jensen, G. Charalambopoulou, T. A. Steriotis 1-3/6/2016 - HyDem (Aarhus, DK) Poster: Nanoconfinement of metal imides in mesoporous carbons, **F. Peru**, A. Santoru, C. Pistidda, G. Charalambopoulou, C. Milanese, S. Garroni, M. Dornheim, T.A. Steriotis 14-18/9/2015 – E-MRS 2015 Fall Meeting (Warsaw, PL) Talk: Hydrogen storage properties of metal imides-based composites nanoconfined in mesoporous carbons, **F.Peru**, A. Santoru, C. Pistidda, G. Charalambopoulou, C. Milanese, M. Dornheim, T.A. Steriotis 1-3/3/2015 – OZ-2015 (Kyoto, JP) Poster: Irreversible nanoconfinement of a 1:1 Mg(NH2)2 and LiNH2 mixture in mesoporous carbon scaffolds, **F. Peru**, A. Ampoumogli, G. Charalambopoulou, M. Dornheim, C. Pistidda, A. Santoru, T. Steriotis 21-26/10/2012 MH2012 (Kyoto,JP) Contribution: Ordered Mesoporous Scaffolds for the Confinement of Nanosized Complex and Metal Hydrides. E.Tolu, **F.Peru**, R. Campesi, F.Dolci, C. Milanese, A. Marini, E. Pellicer, M.D.Baró. S. Garroni, G. Mulas 21/10/2011 La chimica in Sardegna nell'anno della chimica. (Tramariglio, Alghero, IT) Immagazzinamento di idrogeno in fase solida mediante idruri nanofasici confinati in matrici mesoporose. **F. Peru**, S. Garroni, E. Tolu, N. Senes, A. Taras, E. Napolitano, S. Enzo, G. Mulas
Mother tongue Other languages -level	Italian/Sardinian English Good Basic knowledge of Spanish (Verbal/Reading understanding) French (Reading understanding) Greek (Verbal/Reading understanding)