

CURRICULUM VITAE - LAURA SILVESTRONI



PERSONAL PROFILE

Date of Birth: 15.07.1981
Place of Birth: Faenza (Ra), Italy
Citizenship: Italian
Address: Via Repubblica, 24, 48026 Russi (Ra), Italy
Tel.: +39 0544 581928
Mobile: +39 3405686279
Affiliation: National Research Council of Italy - Institute of Science and Technology for Ceramics (CNR-ISTEC)
Address: Via Granarolo 64, 48018 Faenza, Italy
Tel. +39 0546 699723
Fax. +39 0546 46381
e-mail: laura.silvestroni@istec.cnr.it

EDUCATION

30/03/09 **PhD of Industrial Chemistry** (University of Bologna)
Thesis title: Development and Characterization of non-oxide composite ceramics for thermo-mechanical and tribological applications.
15/07/05 **Master of Products, Materials, Processes for Industrial Chemistry** (University of Bologna, Italy)
Thesis title: Preparation and characterization of HfB₂-based ultra-high temperature ceramics, carried out at ISTEC-CNR, 110/110 cum laude.
29/10/03 **Bachelor of Science and Technology of Ceramic Materials** (University of Faenza, Ra, Italy)
Thesis title: Study of heavy metals in PM₁₀ in province of Ravenna, carried out at ARPA (Regional Agency for Prevention and Ambient of Emilia Romagna, Ravenna, Italy), 110/110 cum laude.

WORKING EXPERIENCES

01/07/15-30/06/16 **Visiting Researcher**, Technische Universität Darmstadt (Germany).
Focus: Microstructure analysis of as-sintered and oxidized ceramic by SEM and TEM.
Since 16/10/12 **Permanent Researcher**, CNR-ISTEC, III level.
09/09/13-01/10/13 **Visiting Researcher**, MS&T, Rolla (Department of Materials Science & Engineering at the Missouri University of Science & Technology, Rolla, USA).
Focus: Dual composite ceramics for improved properties, Materials World Network Program.
13/09/10-15/10/12 **Fellowship**, CNR-ISTEC, III level researcher, temporary contract.
Focus: Development, microstructural and thermo-mechanic characterization of non-oxide ceramics for high temperature applications.
12/10/10 -23/10/10 **Visiting Researcher**, SAV - Slovenská Akadémia Vied, Institute of Inorganic Chemistry, Bratislava, Slovakia.
Focus: BN coating on Hi-Nicalon SiC chopped fibers.
07/11/09-21/11/09 **Visiting Researcher**, SIC-CAS (Shanghai Institute of Ceramics – Chinese Academy of Sciences), Cina.
Focus: Processing and sintering of ZrB₂-SiC-WC ceramics and UHTCs annealing.
13/06/08-31/07/10 **Fellowship**, CNR-ISTEC, research grant.
Focus: Production and characterization of structural ceramics for thermal protections with superior thermo-mechanical and insulating properties.
01/09/07-31/05/08 **Fellowship**, Technische Universität Darmstadt (Germany).
Focus: Ceramics characterization through transmission electron microscopy.
09/01/05-01/11/08 **Fellowship**, CNR-ISTEC, research grant.
Focus: Fabrication, microstructural and thermo-mechanic characterization of ceramics for anti-wear and anti-erosion applications.

LANGUAGE SKILLS

Italian Native speaker,
English Very good mastery of oral and written language,
French Very good mastery of oral and written language,
German Basic.

RESEARCH ACTIVITIES

Research field Design, production and characterization of structural ceramics. Powder treatment, ceramic shaping, sintering, microstructural characterization (XRD, SEM, TEM), mechanical characterization (flexural strength, fracture toughness,

Young's modulus, hardness, nanoindentation), oxidation behavior, correlations among process-microstructure-thermo-mechanical properties.

Selected publications

1. L. Silvestroni, D. Sciti, J. Kling, S. Lauterbach, H-J. Kleebe, "Sintering Mechanisms of Zirconium and Hafnium Carbides doped with MoSi_2 ", *Journal of the American Ceramic Society* 92 [7] 1574–1579 (2009).
2. L. Silvestroni, H-J. Kleebe, S. Lauterbach, M. Müller, D. Sciti, "Transmission Electron Microscopy on Zr- and Hf-borides with MoSi_2 addition: Densification Mechanisms", *Journal of Materials Research* 25 [5] 828-834 (2010).
3. L. Silvestroni, D. Sciti, C. Melandri, S. Guicciardi, "Toughened ZrB_2 - based ceramics with addition of SiC whiskers or chopped fibres", *Journal of the European Ceramic Society* 30, 2155–2164 (2010).
4. L. Silvestroni, D. Sciti, "Densification of ZrB_2 - TaSi_2 and HfB_2 - TaSi_2 Ultra-High-Temperature Ceramic Composites", *Journal of the American Ceramic Society*, 94 [6], 1920-1930 (2011)
5. L. Silvestroni, D. Sciti, "Oxidation of ZrB_2 Ceramics Containing SiC as Particles, Whiskers, or Short Fibers", *Journal of the American Ceramic Society* 94 [9] 2796–2799 (2011).
6. D. Sciti, R. Savino, L. Silvestroni, "Aerothermal behavior of a SiC fiber-reinforced ZrB_2 sharp component in supersonic regime", *Journal of the European Ceramic Society* 32 [8] 1837–1845 (2012).
7. L. Silvestroni, S. Guicciardi, M. Nygren, C. Melandri, D. Sciti. "Effect of the sintering additive on the microstructure and thermo-mechanical properties of Hi-Nicalon™ SiC fibers in a HfB_2 matrix", *Journal of the American Ceramic Society*, 96 [2] 643-650 (2013).
8. L. Silvestroni, G. Meriggi, D. Sciti, "Oxidation behavior of ZrB_2 composites doped with various transition metal silicides", *Corrosion Science*, 83, 281-291 (2014).
9. L. Silvestroni, E. Landi, K. Bejtka, A. Chiodoni, D. Sciti, "Oxidation behavior and kinetics of ZrB_2 containing SiC chopped fibers", *Journal of the European Ceramic Society*, 35 [16] 4377-4387 (2015).
10. L. Silvestroni, D. Dalle Fabbriche C. Melandri, D. Sciti, "Relationships between Carbon fiber type and interfacial domain in ZrB_2 -based ceramics", *Journal of the European Ceramic Society*, 36 [1] 17-24 (2016).
11. L. Silvestroni, H-J. Kleebe, W.G. Fahrenholtz, J. Watts "Super-strong materials for temperatures exceeding 2000°C", *Scientific Reports* 7, 40730; doi: 10.1038/srep40730 (2017). 4.259
12. L. Silvestroni, H-J. Kleebe, "Critical oxidation behavior of Ta-containing ZrB_2 composites in the 1500-1650°C temperature range", *Journal of the European Ceramic Society*, 37 (2017) 1899–1908. 3.411
13. L. Silvestroni, D. Sciti, F. Monteverde, K. Stricker, H-J. Kleebe, "Microstructure evolution of a W-doped ZrB_2 ceramic upon high-temperature oxidation", *Journal of the American Society*, 100 [4] (2017) 1760-1772.
14. L. Silvestroni, S. Failla, I. Neshpor, O. Grigoriev, "Method to improve the oxidation resistance of ZrB_2 -based ceramics for reusable space systems", *Journal of the European Ceramic Society*, 38 [6] (2018)2467-2476.
15. L Silvestroni, K. Stricker, D. Sciti, H.-J. Kleebe, "Understanding the oxidation behavior of a ZrB_2 - MoSi_2 composite at ultra-high temperatures", *Acta Materialia*, 151 [1] (2018) 216-228.
16. D.M. Trucchi, A. Bellucci, M. Girolami, P. Calvani, E. Cappelli, S. Orlando, R. Polini, L. Silvestroni, D. Sciti, A. Kribus, "Solar Thermionic-Thermoelectric Generator (ST2G): concept, material engineering, and prototype demonstration", in press at *Advanced Energy Materials*.

Bibliometry parameters

Number of ISI publications: 97
Number of patents: 3
Chapters in Books: 3
h-Index = 25

Invited seminars

1. Conference for Young Scientists in Ceramics, October 16-19 2019, Novi Sad, Serbia.
2. V Spanish- Portuguese Congress of Ceramics, Barcelona, October 8-10, 2018. - *Opening plenary*.
3. CIMTEC 2018- 14th International Ceramic Congress, Perugia, Italy, June 4-8, 2018.
4. LINCET 1- Leverhulme International Network on Composites for Extreme Temperatures, Downing College, Cambridge, March 30-31, 2017.
5. 40th International Conference and Exposition on Advanced Ceramics and Composites, Daytona Beach- FL, January 24-29, 2016. - TEM study on UHTCs and composites.
6. Ultra-High Temperature Ceramics: Materials for Extreme Environment Applications II, An ECI conference, Surfers Paradise – Australia, April 12-16, 2015. - UHTCMCs: short vs continuous fibers – *Plenary*.
7. CIMTEC 2014- 13th International Ceramic Congress, June 8-13, 2014, Montecatini Terme, Italy. - Characterization of UHTCs containing various kinds of fibers.
8. Fukuoka University, Japan, August 28th 2013. - UHTCs reinforced through addition of short SiC fibers.
9. Workshop on the Design of Ceramic-Fiber Based Composites for Service Above 1400°C, Boulder- Colorado, June 10-16, 2012 – ZrB_2 and HfB_2 toughened with Hi-Nicalon SiC chopped fibers.
10. AFOSR Workshop on Aerospace Materials for Extreme Environments, St Louis- MS, August 2-5 2009 –Toughened ZrB_2 -based ceramics with addition of SiC whiskers or short fibers.
11. AFRL-Air Force Research Laboratory, Dayton OH, January 16th 2009. - An attempt to improve the fracture toughness of ZrB_2 -based UHTCs.
12. NASA Glenn Research Center, Cleveland OH, January 15th 2009. - The importance of TEM analyses for the development of UHTC with tailored microstructure.

Awards

- Outstanding Reviewer Award 2018 for: *Corrosion Science*, *Carbon*, *Materials Characterization*.
- CNR-DSCTM Young Investigator Award, July 2018.
- CNR-ISTEC ERC Competition, November 2016.
- JACerS Reviewer Award 2012.
- Selected among Italian Young Talents (TNT), Rome November 17-21 2010, Italian Minister of Youth.
- 10th ECERS, Berlin 2007: 2nd prize for the "Best Student Lecture Competition".
- 30th ICACC, Daytona Beach- Florida, 2006: 3rd place "Best Poster Award".

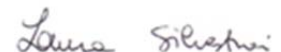
Recent projects

- FORCE (US ARMY ACC, W911NF1920253): Functionally graded fiber-Reinforced Ceramics for Extreme environments. 2019-2020. **Principal Investigator.**
- C3HARME (H2020-685594): Next generation Ceramic Composites for Combustion in Harsh environment and Space. 2016-2019. **Task leader – T 3.1.**
- LIGHT-TPS (FP7-SPACE-2013-1): Super light-weight thermal protection system for space application. 2014-2016. **Unit Coordinator.**
- FIRB 2012: Ultra-refractory ceramic absorbers for thermodynamic solar energy generation at high temperature. 2012-2014. **Coordinator.**
- AFOSR: High Resolution Transmission Electron Microscopy Investigations of Ultra High Temperature Materials. 2009 and 2011-2013. **Co-PI.**
- NSF-Materials World Network Program, Dual composite ceramics for improved properties. 2012-2014.
- SMARP: Development of ultra-ablation resistant ceramics for application in the propulsion, in the frame of P.N.M.R. 2012-2014.
- CIRA - Centro Italiano di Ricerche Aerospaziali, Capua, Italia. "Delivery of toughened bulk UHTC and microstructural and thermo-mechanical characterization". November 30th 2010 - June 1st 2011.
- E²PHEST²US – Enhanced Energy Production of Heat and Electricity by a Combined Solar Thermionic-Thermoelectric Unit System (7th FRAMEWORK PROGRAMME, THEME ENERGY). 01.2010 – 12.2012.
- Research contract ACU RM/659/F/SC between CNR-ISTEC and MBDA Missile Systems Italia S.p.A, "Study and production of multifunctional nano-structured ceramics to obtain electromagnetic windows MMW". 10.01.2008-07.30.2010.
- SFB (Sonderforschungsbereich) 595 - Center of excellence 595 - Electrical Fatigue in Functional Materials: Production, characterization, modelling and properties of ferroelectrics, ionic conductors and semiconducting polymers. German Research Foundation. 10.01.07-05.31.08.

Scientific services

- Editor of the Journal of the European Ceramic Society.
- Member founder of the European Young Ceramists Network.
- Member of the Scientific committee of The ECI Conference: "Ultra-high Temperature Ceramics: Materials for Extreme Environment Applications III", Queensland, Australia, April 2015.
- Member of the evaluation panel at NSF Professional Development Workshop in Ceramics (NSF Grant DMR 1048443), Westin Arlington Gateway, Arlington, VA 22203, May 23-24, 2011.
- Referee for US National Science Foundation.
- Referee for Swiss National Science Foundation.
- Referee for European Science Foundation.
- Scientific leader for contracts with companies.
- Mentoring activity for undergraduate, bachelor and master students.

Faenza 31.10.19



*Il presente Curriculum è reso sotto forma di dichiarazione sostitutiva di certificazione e di dichiarazione sostitutiva dell'atto di notorietà ai sensi degli artt. 46 e 47 del d.P.R. 445/2000. All'uopo il sottoscritto dichiara di essere consapevole della responsabilità penale prevista, dall'art. 76 del citato decreto per le ipotesi di falsità in atti e dichiarazioni mendaci ivi indicate.
Il sottoscritto autorizza il trattamento dei dati personali in esso contenuti e per le finalità connesse all'uso dello stesso ai sensi del d.lgs. n. 196/03 e successive modifiche e integrazioni.*