

PERSONAL  
INFORMATION

Antonio Vinci



+39 3400968408

[antonio.vinci@istec.cnr.it](mailto:antonio.vinci@istec.cnr.it)  
[antoniovinci91@gmail.com](mailto:antoniovinci91@gmail.com)  
[antoniovinci91@pec.it](mailto:antoniovinci91@pec.it)

Sex Male | Date of birth 22/01/1991 | Nationality Italian

WORK EXPERIENCE

11/2018 – Present

Research fellowship at CNR – ISTEK (Prot: 0002259)

CNR – Institute of Science and Technology for Ceramics, Faenza, Italy

▪ Fabrication and characterization of Ultra-high temperature ceramic matrix composites

Business or sector Research and Development

EDUCATION AND TRAINING

11/2015 – 03/2019

PhD in Materials Science and Technology

University of Parma

Associated with CNR – Institute of Science and Technology for Ceramics, Faenza, Italy  
(Prot: 0002721)

▪ Thesis title: Fabrication and characterization of fibre reinforced UHTC composites

Supervisor: Dr. Diletta Sciti, Dr. Luca Zoli

Business or sector Research and Development

18/06/2018 – 28/07/2018

Visiting Scholar at DLR

DLR – Deutsches Zentrum für Luft und Raumfahrt, Stuttgart, Germany

▪ Reactive melt infiltration of carbon fibre reinforced UHTCs

Supervisor: Prof. Dietmar Koch

Business or sector Research and Development

20/07/2017 – 16/09/2017

Visiting Scholar at MS&T

MS&T – Missouri University of Science and Technology, Rolla (MO), USA

▪ Thermo-mechanical behaviour of fibre reinforced UHTCs with a carbide matrix

Supervisor: Prof. William G. Fahrenholtz, Prof. Gregory E. Hilmas

Business or sector Research and Development

11/2013 – 10/2015

Master's degree in "Industrial Chemistry", final mark 103/110

University of Bologna, Italy

▪ Thesis title: "New catalysts for medium and high temperature Water Gas Shift reaction"

Supervisor: Prof. Angelo Vaccari

- 09/2010 – 11/2013 **Bachelor's degree in "Industrial Chemistry", final mark 110/110 cum laude**  
 University of Catania, Italy  
 ▪ Thesis title: "Co and Ru catalysts supported on TiO<sub>2</sub> for the hydrolysis of NaBH<sub>4</sub> for the application in fuel cells "  
 Supervisor: Prof. Carmelo Crisafulli
- 06/2009 **First Certificate of English language (FCE) – B2**  
 Cambridge English Language Assessment  
 English – B2
- 05/2008 – 07/2008 **English Language Summer School**  
 Federation of English Language Teaching Organization Malta  
 English – Level: upper intermediate
- 09/2004 – 07/2009 **Classic High School, final mark 89/100**  
 "Liceo Classico E. Majorana", secondary school, Italy

## PERSONAL SKILLS

Mother tongue Italian

Other language

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	B2	B2	B2	B2
First Certificate of English (FCE) – B2					

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user  
[Common European Framework of Reference for Languages](#)

Communication skills

- Good written skills gained while conducting research activities and writing scientific papers, posters, funding applications and project proposals.
- Good verbal skills gained during the presentation of results at project meetings and international conferences and workshops

Organisational / managerial skills

- Aptitude for teamwork and ability to work independently, very good organizational skills and planning of activities with long dead times in order to maximize the efficiency of time-consuming processes, good adaptability and time flexibility, efficient under stress or under impending deadlines.

## Job-related skills

Experience in

- Processing-microstructure-properties correlation of fibre reinforced ceramic composites through the use of SEM, EDS and XRD
- Processing of fibre reinforced ceramic matrix composites (Slurry infiltration, Polymer infiltration and Pyrolysis, Reactive Melt Infiltration, Hot Pressing)

Good knowledge and use of analytical techniques and manufacturing processes:

- **Reactive Melt Infiltration** of fibre preforms (previously infiltrated by SI or PIP) with liquid silicon or zirconium alloys for the fabrication of fully dense ceramic matrix composites
- **Slurry infiltration (SI)** of fibre preforms with a vast array of ceramic powders (borides, carbides, oxides) for the fabrication of ceramic matrix composites
- **Polymer infiltration and pyrolysis (PIP)** of fibre preforms with phenolic resins for the fabrication of C/C ceramic matrix composites
- **Plaster mold casting** with gypsum for the fabrication of crucibles, cases and molds for silicone rubber molding.
- **SEM/EDS** for the analysis of the morphology, microstructure and composition of polished and fractured materials and the correlation of these features with the mechanical and oxidation behaviour
- **TGA/DTA/DSC** for the thermal analysis of materials designed for high temperature applications, and the determination of their decomposition temperatures
- **X-Ray diffraction** analysis for the identification of crystal phases and potential phase transitions at high temperature of mixed oxides, spinels, borides and carbides.
- **UV-Vis spectroscopy** for the analysis of reaction by-products, such as alcohols and ammonia
- **BET surface area** analysis for the measurement of the active surface area of catalysts which can be correlated to their activity
- **Temperature Programmed Reduction/Oxidation** for the determination of the activation/deactivation temperature of catalysts
- **Gas Chromatography** for the analysis of gaseous species at the outlet of the reactor and calculation of a catalyst activity
- **Proficiency with work tools and power tools** (Cutting machine, vertical drill, surface grinder) for the fabrication and assembly of components, piping, drilling, sawing, cutting, sharpening and polishing of workpieces

## Digital skills

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem solving
Independent	Independent	Independent	Independent	Independent

Levels: Basic user - Independent user - Proficient user  
[Digital competences - Self-assessment grid](#)

Replace with name of ICT-certificates

- Good knowledge of **MS Excel** for data analysis, integration, curve fitting and creation of complex spreadsheets for data simulation for the analysis of chemical activity and thermodynamic calculations and powder mixtures preparation
- Good knowledge of **MS PowerPoint** for presentations and editing
- Good knowledge of **MS Word** for the writing of papers and reports
- Good knowledge of reference tools (**Mendeley**) for bibliography
- Good knowledge of **Image Pro Analyser 7.0** for Image Analysis of porosity, secondary phases, fibres and grain size
- Fair knowledge of **JADE** for XRD analysis and phase identification
- Fair knowledge of **MatLab curve fitting tools** for the analysis of kinetic curves and the determination of reaction rate and activation energies
- Fair knowledge of **OriginLab** for curve and peak integration

Driving licence B

## ADDITIONAL INFORMATION

### Publications

**H-Index:** 8 (Scopus) since 2017, **n° publications:** 14, **n° citations:** 115

- L. Zoli, A. Vinci, P. Galizia, S. Rivera, D. Sciti "*Is spark plasma sintering suitable for the densification of continuous carbon fibre - UHTCMCs?*", J. Eur. Ceram. Soc. (2019) – in Press
- A. Vinci, L. Zoli, D. Sciti, J. Watts, G.E. Hilmas, W.G. Fahrenholtz, "*Influence of fibre content on the strength of carbon fibre reinforced HfC/SiC composites up to 2100 °C*", J. Eur. Ceram. Soc. 39(13), 3594-3603, 2019
- L. Silvestroni, A. Vinci, S. Failla, L. Zoli, V. Rubio, J. Binner, D. Sciti, "*Ablation behaviour of ultra-high temperature ceramic matrix composites: Role of MeSi<sub>2</sub> addition*" J. Eur. Ceram. Soc. 39(9), 2771-2781, 2019
- S. Mungiguerra, G.D. Di Martino, A. Cecere, R. Savino, L. Silvestroni, A. Vinci, L. Zoli, D. Sciti. "*Arc-jet wind tunnel characterization of ultra-high-temperature ceramic matrix composites*", Corrosion Science 149, 18-28, 2019
- A. Vinci, L. Zoli, D. Sciti, J. Watts, G.E. Hilmas, W.G. Fahrenholtz, "*Mechanical behaviour of carbon fibre reinforced TaC/SiC and ZrC/SiC composites up to 2100°C*", J. Eur. Ceram. Soc. 39(4), 780-787, 2019
- A. Vinci, L. Zoli, D. Sciti. "*Processing and characterization of carbon fibre reinforced ZrB<sub>2</sub>/SiC/WC composites*", Proceedings of the 1<sup>st</sup> Workshop for Young Ceramists, 2018
- S. Failla, P. Galizia, L. Zoli, A. Vinci, D. Sciti, "*Toughening effect of non-periodic fiber distribution on crack propagation energy of UHTC composites*", J. Alloys & Comp. 777, 612-618, 2018
- G. Di Martino, S. Mungiguerra, A. Cecere, A. Vinci, L. Zoli, D. Sciti "*Hybrid rockets with nozzle in ultra-high-temperature ceramic composites*" Proceedings of the International Astronautical Congress, IAC 2018
- P. Galizia, A. Vinci, L. Zoli, C. Melandri, D. Sciti, "*On the thermal shock resistance and mechanical properties of novel unidirectional UHTCMCs for extreme environments*", Scientific Reports, 8, 9148, 2018
- A. Vinci, L. Zoli, D. Sciti, "*Influence of SiC content on the oxidation of carbon fibre reinforced ZrB<sub>2</sub>/SiC composites at 1500 and 1650 °C in air*", J. Eur. Ceram. Soc. 38(11),

3767-3776, 2018

- A. Vinci, L. Zoli, D. Sciti, C. Melandri, S. Guicciardi, "Understanding the mechanical properties of novel UHTCMCs through random forest and regression tree analysis", *Materials & Design* 145, 97-107, 2018
- D. Sciti, L. Silvestroni, L. Zoli, A. Vinci, F. Monteverde. "Introduction to H2020 project C3HARME: Next generation ceramic composites for combustion harsh environments and space", *Proceedings of ECI conference*, 2017
- A. Vinci, L. Zoli, E. Landi, D. Sciti, "Oxidation behavior of a continuous carbon fibre reinforced  $ZrB_2/SiC$  composite", *Corrosion Science* 127, 129-138, 2017
- L. Zoli, A. Vinci, L. Silvestroni, D. Sciti, M. Reece, S. Grasso, "Rapid spark plasma sintering to produce dense UHTCs reinforced with undamaged carbon fibres", *Materials & Design* 130, 1-7, 2017

## Conferences

**Oral presentations:** 12 (presenting author, 1 invited) 12 (contributing author)

*Presenting author:*

- Invited, A. Vinci, L. Zoli, D. Sciti "Fabrication and characterization of carbon fibre reinforced UHTC composites", **ICACC'20**, Daytona Beach (FL), January 24-31, 2020
- A. Vinci, L. Zoli, P. Galizia, L. Silvestroni, D. Sciti, S. Mungiguerra, R. Savino "Fabrication and characterization of UHTCMCs based on the  $ZrB_2/SiC/Y_2O_3$  system", **HT-CMC/10<sup>th</sup>**, Bordeaux(France), September 22-26, 2019
- A. Vinci, L. Zoli, D. Sciti "Processing and characterization of carbon fibre reinforced  $ZrB_2/SiC/WC$  composites", **ECerS 2019**, Torino(Italy), June 17-20, 2019
- A. Vinci, L. Zoli, D. Sciti, M. Küttemeyer, D. Koch, "Reactive Melt Infiltration of carbon fibre reinforced  $ZrB_2$  composites with  $Zr_2Cu$ ", **ICACC'19**, Daytona Beach (FL), January 27-31, 2019
- A. Vinci, L. Zoli, D. Sciti, M. Gutierrez, S. Riveira, "Damage tolerant carbon fibre reinforced  $ZrB_2/SiC$  composites", **ICACC'19**, Daytona Beach (FL), January 27-31, 2019
- A. Vinci, L. Zoli, D. Sciti, T. Reimer, D. Koch, "Oxidation resistance of carbon fibre reinforced  $ZrB_2/SiC$  composites at  $T>2000^\circ C$ ", **ICACC'19**, Daytona Beach (FL), January 27-31, 2019
- A. Vinci, L. Zoli, D. Sciti, "Fabrication and characterization of carbon fibre reinforced  $ZrB_2/SiC/WC$  composites", **Workshop for Young Ceramists – Speech contest**, Bologna (Italy), November 26-27, 2018 *2<sup>nd</sup> Best oral presentation*
- A. Vinci, L. Zoli, D. Sciti, J. Watts, G. Hilmas, W.G. Fahrenholtz, "Mechanical behaviour of carbon fibre reinforced carbides up to  $2100^\circ C$ ", **Materials.it 2018**, Bologna(Italy), October 22-26, 2018
- A. Vinci, L. Zoli, D. Sciti, "Fabrication and characterization of carbon fibre reinforced UHTCs", **YCN workshop 2018**, Smolenice (Slovakia), October 2-4, 2018
- A. Vinci, L. Zoli, D. Sciti, J. Watts, G. Hilmas, W.G. Fahrenholtz, "Thermo-mechanical behavior of novel UHTCMCs with a carbide matrix at temperatures above  $1800^\circ C$ ", **ICACC'18**, Daytona Beach (FL), January 21-26, 2018
- A. Vinci, L. Zoli, D. Sciti, "Oxidation behaviour at  $1650^\circ C$  of carbon fibre reinforced  $ZrB_2/SiC$  composites", **ECI**, Windsor (UK), September 17-20, 2017
- A. Vinci, L. Zoli, D. Sciti, "Effect of  $SiC$  on the oxidation resistance of carbon fibre reinforced  $ZrB_2/SiC$ ", **ECerS 2017**, Budapest (Hungary), July 9-13, 2017
- A. Vinci, L. Zoli, C. Melandri, D. Sciti, "Effect of  $SiC$  addition on the mechanical properties of  $ZrB_2/SiC/Cf$  based UHTCMCs", **Materials.it 2016**, Aci Castello, December 12-16, 2016

*Contributing author:*

- S. Mungiguerra, G. Di Martino, R. Savino, L. Zoli, A. Vinci, D. Sciti, "Experimental investigation on sintered UHT-CMC composites for Combustion Harsh Environments and Space" **HT-CMC/10<sup>th</sup>**, Bordeaux(France), September 22-26, 2019
- T. Reimer, D. Sciti, D. Koch, M. Kuetemeyer, A. Vinci, L. Silvestroni, P. Galizia, F. Monteverde, S. Rivera, "High-Temperature Mechanical Characterization of UHTCMCs" **HT-CMC/10<sup>th</sup>**, Bordeaux(France), September 22-26, 2019
- F. Monteverde, D. Sciti, L. Silvestroni, L. Zoli, F. Saraga, A. Vinci, P. Galizia, T. Reimer, "Retained strength of UHTCMCs treated above 2273 K in oxidizing environment" **HT-CMC/10<sup>th</sup>**, Bordeaux(France), September 22-26, 2019
- D. Sciti, L. Zoli, A. Vinci, P. Galizia, L. Silvestroni, T. Reimer, S. Rivera, "*The effect of PAN or pitch-based C fibres on the microstructure and properties of continuous Cf- ZrB<sub>2</sub>/SiC UHTCMCs*" **HT-CMC/10<sup>th</sup>**, Bordeaux(France), September 22-26, 2019
- P. Galizia, L. Zoli, A. Vinci, S. Failla, F. Saraga, D. Sciti "*Spring(s) in harsh environments: micromechanical modelling of UHTCMCs*" **ENG CER19**, Smolenice Castle(Slovakia), May 14, 2019
- L. Zoli, D. Sciti, L. Silvestroni, P. Galizia, A. Vinci, "*UHTCMCs with a boride matrix for novel rocket nozzles*", **CICC-11<sup>th</sup>**, Kunming (China), May 25-29, 2019
- P. Galizia, L. Zoli, A. Vinci, S. Failla, D. Sciti, "*The challenging mechanical characterization of continuous fiber-reinforced ultra-high temperature ceramics for extreme conditions*", **Materials.it 2018**, Bologna(Italy), October 22-26, 2018
- D. Sciti, L. Zoli, A. Vinci, S. Failla, P. Galizia, Invited "*Hi-Tech Ceramics and Composites for Harsh Environments*", **Materials.it 2018**, Bologna(Italy), October 22-26, 2018
- L. Zoli, A. Vinci, P. Galizia, D. Sciti, "*Ultra-high temperature Ceramic matrix composites for extreme environments*", **Materials.it 2018**, Bologna(Italy), October 22-26, 2018
- D. Sciti, A. Vinci, P. Galizia, L. Silvestroni, L. Zoli, Invited "*Advances in the processing and characterization of UHTC-Composites for Aerospace*", **ICC7**, Brazil, June 17-2, 2018
- L. Zoli, A. Vinci, S. Failla, P. Galizia, D. Sciti, "*Mechanical properties and microstructure of unidirectional UHTCMCs*", **CIMTEC**, Perugia (Italy), June 4-8, 2018
- D. Sciti, A. Vinci, L. Zoli, "*Developing UHTCMCs: effect of matrix additives on the resistance to oxidation*", **Pacific Rim Conference**, Waikoloa, Hawaii (US), May 21-26, 2017

**Posters: 3**

- D. Sciti, F. Monteverde, L. Silvestroni, L. Zoli, A. Vinci, S. Failla, "*Hi-Tech Ceramics and Composites for Severe Environments*", **Conferenza di dipartimento CNR**, Assisi (Italy) September 24-26, 2018
- A. Vinci, L. Zoli, E. Landi, D. Sciti, "*Oxidation behavior of a continuous carbon fiber reinforced ZrB<sub>2</sub>/SiC/Si<sub>3</sub>N<sub>4</sub> composite*", **WGCC** – Cuenca (Spain), September 28-30, 2016
- C. Lucarelli, R. Faure, G. Fornasari, D. Gary, N. Schiaroli, A. Vaccari, A. Vinci, "*Effect of metal oxide additives on the activity and stability of medium temperature Water Gas Shift catalysts*", **GIC 2015**, Amantea (Italy), June 14-17, 2015

**Memberships**

Italian Ceramic Society (ICerS) 2016 - present

## Honours and awards

- Winner of a grant funded by JECS Trust to attend HT-CMC19 in Bordeaux(France), 2019 for a value of **500€**
- 2<sup>nd</sup> Best oral presentation at the Workshop for Young Ceramists, Bologna 2018 and winner of a grant funded by JECS Trust to attend ECerS'19 conference in Turin (IT), 2019 for a value of **750€**(conference fee)
- Winner of a grant funded by JECS Trust to attend ICACC'19 winter workshop in Daytona Beach (FL), 2019 (Contract 2016124-23, funding received: **1200€**)
- Winner of a grant funded by JECS Trust to attend ICACC'18 winter workshop in Daytona Beach (FL), 2018 (Contract 2016124-10, funding received: **1200€**)
- Winner of a travel grant funded by the American Ceramic Division of ACerS to attend ICACC'18 conference in Daytona Beach (FL), 2018 for a value of **175\$**
- Winner of a grant funded by JECS Trust to attend ECI conference in Windsor, UK, 2017 for a value of **500€**
- Winner of a grant funded by JECS Trust for research activity at Missouri University of Science and Technology, Rolla (MO), 2017 (Contract 2016124-1, funding received: **2800€**)
- Winner of a grant to attend WGCC conference in Cuenca, Spain, 2018, for a value of **150€**(workshop fee)
- Full-time involvement in the European project n°685594, H2020 "C<sup>3</sup>HARME" for the fabrication and characterization of UHTC composites (duration: 4 years, Prot. 0002545)
- Associated with ISTEC – CNR for the duration of the PhD activity (Prot. 0002721)
- Winner of a PhD scholarship (2015 – 2018) in materials science and technology at the University of Parma in association with ISTEC – CNR