

# Curriculum vitae - VALENTINA DOMENICI

## Personal information:

Valentina Domenici was born on March 17<sup>th</sup>, 1977 in Livorno (Italy).

She lives at Rosignano Solvay (LIVORNO-Italy).

## Actual position:

She is now working at the "Dipartimento di Chimica e Chimica Industriale" (**DCCI**), University of Pisa, as "**Associate Professor**" in the field of **Chemical Physics** (since November 2016) and she is qualified by ANVUR as full professor (since August 2017). She is **Teacher** of the following courses for undergraduate students in the same University: "**Fundamentals and methods for chemical education**", "**History of Chemistry and chemical education**", "**Chemical Physics of Soft Matter**" and "**Chemical Physics and Laboratory (Spectroscopy)**".

## Education:

1. She attended the high school from 1991 to 1996 (Liceo E. Fermi, Cecina-Livorno) (grade 60/60).
2. She graduated in **Chemistry** in 2001 (grade 110/110 summa cum laude) at the **University of Pisa** with the thesis title "Study of Molecular Structure, Order and Dynamics of Liquid Crystals by means of Nuclear Magnetic Resonance" (Prof. C.A. Veracini and Prof. G. Galli as supervisors).
3. She defended her Ph.D. thesis in "**Chemical Science**" at the "Galileo Galilei" Ph.D. School of the **University of Pisa** (from January 2002 to February 2005) with the title: "Orientational order and Dynamics by means of <sup>2</sup>H NMR of rod-like and banana-shaped Liquid Crystals: new developments", under the supervision of Prof. C.A. Veracini and Prof. E.T. Samulski. (final defending on the 22<sup>th</sup> of February 2005).
4. She attended the Master Course of "**Communication of Science**", at **SISSA in Trieste**, from 2004 to 2006, and she defended the Master Degree the 20<sup>th</sup> of November 2006, with the research topic: "The Image of Chemistry from Museums and Collections of Chemistry in Italy", under the supervision of Dr. Paola Rodari and Dr. Pietro Greco.

## Research work experiences:

1. She worked at the **DCCI, Università di Pisa, (Italy)**, with several *research contracts* on "Structural characterization of fluorinated polymers by means of NMR" (from 17/01 to 31/08/2005), "Analysis of NMR spectra of liquid-crystalline systems" (from 05/09 to 04/12/2005), "<sup>13</sup>C NMR of chiral mesogens" (from 02/01 to 28/02/2006), "Liquid crystalline monomers and polymers by means of NMR" (from 08/04/2006 to 31/12/2006).
2. She was employed as "**Scientific Associate**" at the **Jozef Stefan Institute**, Department of Solid State Physics - Ljubljana (**Slovenja**) with the Marie Curie Intraeuropean Fellowship (EIF) project: "Synthesis and

characterization of Electromechanically Active Composites of Mesogenic Elastomers and Electrically Active nanoparticles”, (2006-2007).

3. She was employed (from July 2007 to July 2010) as “**Young Researcher**” at Dipartimento di Chimica e Chimica Industriale, Università di Pisa, with the research project: “Study of the order, dynamics and structure of oriented molecular systems by means of theoretical and experimental techniques”.

4. She had a “**Research Grant**” from “L’Oreal Italia – Unesco” (July 2010 – December 2010) with a project about “Characterization of new contrast agents for MRI at high magnetic field”.

5. She was **Visitor Researcher** in the frame of European or Bilateral projects at:

a) Hungarian Research Institute of Solid State Physics and Optics, Budapest, Hungary (2004);

b) Liquid Crystal Group, Department of Dielectrics Institute of Physics - Academy of Sciences of the Czech Republic, Prague, Czech Republic (2005, 2007, 2009, 2010, 2011, 2013, 2014);

c) RALF-NMR Large Scale Facility “Centre de RMN à Très Hauts Champs” Villeurbanne (France) with several projects as a guest of Prof. Lyndon Emsley (December 2009, February 2010, September 2010, March 2013, March 2014);

d) "Department of Condensed Matter Physics" of the *Jozef Stefan Institute & Center of Excellence "NAMASTE"* (Ljubljana - Slovenia) (August 2011, October 2012, July-August 2013).

e) “Laboratory of Physicochemistry of Dielectrics and Magnetics”, Faculty of Chemistry, University of Warsaw (Poland) (May 2013, December 2014).

6. She was working at the “Dipartimento di Chimica e Chimica Industriale” (**DCCI**), University of Pisa, as “**Permanent Researcher**” in the field of **Chemical Physics** from 2010 to 2016.

#### Teaching experiences:

1. She was “*Teaching Assistant*” to the Laboratory of Physical-Chemistry (Molecular Spectroscopy) at DCCI (University of Pisa) in the period from 2002 to 2005.

2. She was “*Lecturer*” or “*Assistant Professor*” for the “Laboratory of Physical Chemistry II (Molecular Spectroscopy)” and “Physical Chemistry II” at the DCCI, Università degli studi di Pisa, (from 2009 to 2013).

3. She was “*Teacher*” (April 2009) for the Course “Chemical Communication” at the ECM Course about Proteomics: “Saper fare per saper comunicare”, at the Institute “Zooprofilattico Sperimentale delle Venezie” (Pd, Italy).

4. She was Teacher of “**Statistical Analysis of Data**” (from 2010 to 2013) at the DCCI;

5. She was Teacher of “**Chemical Education**” in the Course for Teachers of the Secondary School (TFA – 2012-2013 and PAS 2013-2014) and teacher of “**DIDATTICA DELLA CHIMICA E DELLE SCIENZE DELLA TERRA**” (Cod. **DD103**) CdS TFA\_A059 MATEMATICHE E SCIENZE NELLA SCUOLA SECONDARIA DI I GRADO, “**FONDAMENTI E DIDATTICA DELLA CHIMICA**” (Cod. **CC103**) CdS TFA\_A060 SCIENZE NATURALI, CHIMICA E GEOGRAFIA, MICROBIOLOGIA (2014-2015) and “**Termodinamica delle soluzioni, soluzioni organizzate e**

colloidi" (2017-2018).

6. She was Teacher of "**Electrochemistry**" at DCCI (2010-2019).

7. She is actually Teacher of "**Chemical Education**" at DCCI, since 2012.

8. She is actually Teacher of "**History of Chemistry**" at DCCI, since 2017.

9. She is actually Teacher of "**Chemical Physics of Soft Matter**" at DCCI (2018-2019).

10. She is actually Teacher of "**Chemical Physics and Laboratory**" (**molecular spectroscopy**) at DCCI (2019-2020).

11. She is actually Teacher of "**Chemical Education**" at the **Course of Primary Education** at Unipi (2019-2020).

#### **Scientific Awards:**

1. She won the "**Premio Semerano 2005**", for the best Ph.D. thesis in the field of Physical Chemistry by Società Chimica Italiana, Divisione di Chimica Fisica.

2. She won the "**IUPAC prize 2006 for young chemists**", for the most outstanding Ph. D. thesis in the field of chemical science, by the IUPAC.

3. She won the "**Otto Lehmann Award 2006**", for the paper "Dynamics and dielectric properties in a ferroelectric liquid crystal: NMR study and theoretical treatment", J. Phys. Chem. B, 109, 18369, (2005).

4. She won the "**Premio Primo Levi 2005**", by the Società Chimica Italiana, for the paper "Unusual dynamic behaviour in the isotropic phase of banana mesogens detected by  $^2\text{H}$  NMR line width and  $T_2$  measurements", J. Phys. Chem. B, 109, 769, (2005).

5. Best poster at "**ISMASM 2008**" - 2nd International Symposium on the Manipulation of Advanced Smart Materials, at Awaji Yumebutai International Conference Center, Hyogo (Japan), for the work "Effect of the Magnetic Field on the Supramolecular Structure of Chiral Smectic C Phases:  $^2\text{H}$  NMR studies", with C. A. Veracini and A. Marini.

6. "**European Commission Delegate**", selected among more than 20000 young researchers from all over the world by the Review Panel of the Lindau Council to participate to the prestigious *58<sup>th</sup> Meeting of Nobel Prize Winners in Physics* from June 29<sup>th</sup> to July 4<sup>th</sup> 2008 in Lindau / Germany.

7. "**L'Oreal Italia - Unesco 2010 Prize**", WOMEN IN SCIENCE program. She was selected among Italian young researchers with a research program about new MRI contrast agents and relaxation phenomena. Milan, May 24<sup>th</sup> 2010.

8. Selected among the top "*200 young talents*" (under 35) and invited to participate to the "**Festival dei Giovani Talenti 2010**", organized by the Italian Ministry of Young Politics from 17<sup>th</sup> to 20<sup>th</sup> November 2010 in Rome.

### Scientific titles in brief:

1. She published **more than 120 Papers** on international scientific journal peer review, **11** of them are **Invited Review** (as single author). She contributed to 11 **books** as single chapters' author, or book co-editor.
2. She attended more than 160 congresses, presenting both poster communications, oral and invited communications.
3. She is "Cultore della materia" for the course "Physical Chemistry" and "Molecular Spectroscopy" at the Department of Chemistry and Industrial Chemistry (DCCI) in Pisa.
4. She has the National Abilitation to the profession of "**Chemist**" (from 2003).
5. She received a **NASA grant** (NASA University Research, Engineering and Technology Institute on Bio Inspired Materials - No.NCC-1-02037) to support a research carried out in USA from 01/10/2003 to 04/04/2004 (Department of Chemistry at the **University of North Carolina** (USA), Supervisor: Prof. E. T. Samulski).
6. She received 6 **COST grants** (European Cooperation in the field of Scientific and Technical Research) to visit Budapest, Prague and Ljubljana for research purposes from 2004 to 2012.
7. She presented her research giving **more than 30 invited lectures** to several Institutes, Universities and International/European/National Conferences.
8. She was involved in **several national and international projects** concerning: "Banana-shaped Liquid Crystals" (Italian-Hungarian bilateral project); "Diffusion and Molecular Dynamics of liquid crystals" (Royal Society project); "Liquid Crystals" (Italian PRIN 2003 and PRIN 2005); "Molecular systems for optical devices" (three COST projects).
9. She is **member** of the following **associations**: *SICL*, Società Italiana dei Cristalli Liquidi (since 2002); - *SCI* Società Chimica Italiana (since 2004), Divisione di Chimica Fisica (since 2004) and Divisione di Didattica della Chimica (since 2006); - *APS* American Physical Society (from 2004 to 2009); - *MCFA* Marie Curie Fellows Association (since 2008); - *ILCS* International Liquid Crystal Society (since 2010).
10. She is **peer-reviewer** of the following International Journals: Physical Chemistry Chemical Physics (RSC), Soft Matter (RSC), Macromolecular Rapid Communication (Wiley), ChemPhysChem (Wiley), Journal of Physical Chemistry (ACS), Macromolecules (ACS), Journal of American Chemical Society (ACS), Journal of Materials Research (MRS), European Polymer Journal (Elsevier), Journal of Photochemistry and Photobiology A: Chemistry (Elsevier), Polymer (Elsevier), Phase Transitions (Taylor & Francis), Polymers (MDPI), Foods (MPDI), Materials (MPDI), Catalysts (MDPI).
11. She is member of the **Editorial Board** of "**CRYSTALS**" (MDPI) since 2019.
12. She is member of the **Reviewer Board** of "**POLYMERS**" (MDPI) since 2019.

13. She is member of the **Editorial Board** of “**La Chimica nella Scuola, CnS**” (Official Journal of Chemical Education of the Italian Society of Chemistry – SCI) since 2010.
14. She is member of the **Working group** of “**Rete dei Musei di Chimica**” (Italian Society of Chemistry) since 2010.
15. She is member of the **Working group** of “**Etica della Chimica**” (Italian Society of Chemistry) and “**Ethics in Chemistry**” (in European Association EUCHEM) since 2014.
16. She was **principal coordinator** of the project in the frame of Cooperation between Italy and Poland (funded by Italian and Polish Ministry of Abroad Affairs) “**CANALETTO 2013-2015**” with a project on “Interplay between molecular structure and thermomechanic properties of new actuators based on liquid crystal elastomers” (from January 2013 to December 2015).
17. She was the **principal coordinator** of the **MIT-UNIFI project** for the cooperation between UNIFI (PISA, Italy) and MIT (BOSTON, USA) Title of the project: *Energy Storage Devices and Actuators based on Composites of Liquid Crystal Elastomers*. From January 2014 to August 2016.
18. She is involved as member in several COST ACTION projects, such as the on-going **COST ACTION CA15209** (“European Network on NMR Relaxometry”) (2017-).
19. She was **co-founder** of the start-up company **Chema srl** (2012-2019).
20. She is member of the national committee of “Chemical Education” division of the Italian Society of Chemistry (2016-2018 & 2018-2020); of the national committee of “Diffusion of Chemical Culture” division group of the Italian Society of Chemistry (2019-2021); of the regional committee of “Sezione Toscana” of the Italian Society of Chemistry (2017-2019).
21. She is “**associate**” of the **IBBA (Istituto di Biologia e Biotecnologia Agraria) C.N.R.** in Pisa as “**collaborator**” to the research project “**Nutraceutica e produzione di biomolecole**” (from January 2020).
22. Additional information of the research activity can be found at: [smslab.dcci.unipi.it](http://smslab.dcci.unipi.it)

#### **Actual Scientific and Research topics:**

1. NMR Spectroscopy and Chemical-Physical Characterization of Liquid Crystals (such as rod-like, banana-shaped mesogens and side-chain liquid crystal polymers) and Partially Oriented Systems (polymers, dendrimers and biological systems such as membranes);
2. Preparation and Chemical-Physical Characterization of new Films and Composite Bilayers made of Liquid Crystalline Elastomers, to be used as thermo-, photo- and electro-actuators and Artificial Muscles for applications in micro- and bio-robotics;
3. Study of the Molecular Dynamics and Collective Motions of Soft Materials and Food by means of  $^2\text{H}$  NMR and  $^1\text{H}$  NMR relaxation; development of methods for the global target analysis of spin-spin and spin-lattice relaxation times;

4. Preparation and Chemical-Physical investigation of new functionalized nanoparticles as Magnetic Resonance Contrast Agents and Molecular Imaging Probes;
5. Non-destructive Spectroscopic methods (Front-Face Fluorescence, UV-vis, Circular Dichroism and NMR) to investigate minor and major components of Food and Agricultural products (honey, olive oils, wine,...);
6. Communication of Chemistry and Image of Chemistry in the general public. Perception of Chemistry in the general public. Dissemination of Chemistry and Chemical Education in Science Museums.

**Other activities:**

She is fond on minerals and rocks (research and collection). She is interested in reading and writing Scientific Papers and Assays in several fields (from biology to history and philosophy of Science) for the general public. She is member of the Scientific Committee of the *Museo di Storia Naturale di Rosignano Solvay* (LI) and member of the Organizing and Scientific Committee of the Congress "*Codice Armonico*" about Natural Science in Tuscany (biennial meeting since 2006). She collaborates with several groups and associations about "**Dissemination of Chemistry**" (such as "La Scienza in Rete": <http://www.scienzainrete.it/>, TeatroNaturale: <http://www.teatronaturale.it/>). In the past, V. D. has collaborated with "*Ludoteca Scientifica*" - Pisa (2005); "*Le Scienze*", scientific journal, Italian translation of the "Scientific American" (from 2005); on-line journals of scientific communication: <http://ulisse.sissa.it/>: Ulisse, "*la rete della scienza*" and <http://jekyll.sissa.it/>: Jekyll on line. She had collaborations with Italian Editors "*Zanichelli*", "*Mondadori*", "*Pearson Italia*", with contributions to books of chemistry for high-school and intermediate school students. She coordinated several projects for disseminating science and organization of laboratory activities to school children (6-12 age) and in the context of science museums.

**20<sup>th</sup> January 2020**

**Valentina Domenici**