

Fulvio Bisi
Curriculum Vitae et Studiorum

Name/Surname (Nome/Cognome): Fulvio Bisi
Place of birth: Milano
Date of birth: 17 January 1962
Citizenship: Italian
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1981	Student with Fellowship at the Scuola Normale Superiore, Pisa (Italy)
1987	Degree in Physics on July 23rd(summa cum laude) from the University of Pisa (Italy)
1998	Diploma di Perfezionamento in Fisica (PhD in Physics, summa cum laude) from the Scuola Normale Superiore – Pisa (Italy)
1999-2002	Post Doc fellowship from Politecnico di Milano – Department of Mathematics
2002-present	Researcher in Mathematical Physics, Department of Mathematics, University of Pavia (Italy).
2004-05	(25 Sep-9 Oct) Invited Fellow at the Institute for Mathematics and its Applications, University of Minnesota, Minneapolis (USA)
2006	(15-21 Nov) Invited Fellow at the School of Mathematics, University of Southampton, Southampton (UK)
2008	(16 Mar-26 Apr) Invited Fellow at the Department of Mathematical Sciences, Kent State University, Kent (OH-USA)
2009	(24-29 Mar) Invited Fellow at the Department of Mathematics, University of Strathclyde, Glasgow (UK)
2013	(7-11 Jan, 3-28 Mar) Invited Participant in the Programme “The Mathematics of Liquid Crystals”, Isaac Newton Institute for Mathematical Sciences, Cambridge (UK).

Known Languages

English:

First Certificate in English (Cambridge FCE)- June 1999 – Cert. Grade A
Certificate in Advanced English (Cambridge CAE) – June 2000 - Cert. Grade A
Certificate of Proficiency in English (Cambridge CPE) – June 2001 - Cert. Grade A

French-Français

DELFL (Diplôme d'études en langue française) B1 – November 2006

DALFL (Diplôme approfondi de langue française) C1 – June 2007

Spanish-Español

D.E.L.E. (Diploma Básico de Español como Lengua Extranjera) – November 2000 (91.41/100)

Scientific Activity

My present scientific activity is oriented towards the mathematical modelling of soft matter, such as nematic liquid crystals and biological membranes, with particular reference to computational simulations.

Nematic liquid crystals.

Part of the research activity has dealt with the order reconstruction in nematic liquid crystal cells under the effect of a mechanical frustration or of an external field. A non-monotonic behaviour of the mediated forces and torques in the cell has been described in model systems.

A mean field model for thermotropic biaxiality in nematic liquid crystals has been developed; several results have been obtained, as well as some interesting predictions on the phases that can be observed and their relative transitions.

Present research activities in this field aim at assessing the role of steric interactions in the stability of

ordered phases in nematic liquid crystals. In particular, focus is on developing analytical and numerical techniques to compute the excluded volume in rigid molecule models, and on a model that integrates polar electric interactions between molecules with purely steric potentials on the basis of such model, stable polar ferroelectric nematic phases have been predicted, even in the absence of an external field applied.

Biological Membranes: the analytic equilibrium solutions for lipid membranes has been studied, in detail in the two-dimensional case. The membrane-mediated interactions between protein inclusions have been analysed within a two dimensional model.

Recent conferences

- 6-13 April 2003 7th European Conference on Liquid Crystals 2003, Jaca (Spagna).
Oral contribution: F. Bisi et al.: "Order Reconstruction in Frustrated Nematic Twist Cells".
- 4-9 July 2004 20th International Liquid Crystal Conference 2004, Ljubljana (Slovenia).
Oral contribution: F. Bisi et al.: "Mechanics of order reconstruction in nematic liquid crystals".
Posters: F. Bisi et al. "Order reconstruction vs. molecular reorientation in Freederiks transition"; F. Bisi et al.: "Interaction forces between point defects".
- 27 February-4 March 2005 8th European Conference on Liquid Crystals Sesto (BZ) I.
Oral contribution: F. Bisi et al.: "Order reconstruction and molecular reorientation in Freederiks transition".
- 11-16 September 2005 Workshop on Soft Matter Mathematical Modelling (SMMM), Cortona (Italia).
Oral contribution: F. Bisi: "Repertoire of biaxial nematic phases".
- 2-7 July 2006 21st International Liquid Crystal Conference 2006, Keystone, CO (USA).
Oral contribution: F. Bisi et al.: "Universal mean-field phase diagram for biaxial nematics".
- 2-6 July 2007 9th European Conference on Liquid Crystals - Lisbon (P).
Oral contribution: F. Bisi et al.: "Universal features in the nematic uniaxial-to-biaxial transition".
- 19-24 April 2009 10th European Conference on Liquid Crystals - Colmar (F).
Oral contribution: F. Bisi, A.M. Sonnet, E.G. Virga: "Mean-field model for polar nematics"; Poster: F. Bisi et al.: "Excluded-volume short-range repulsive potential for tetrahedral molecules"; Poster: F. Bisi et al.: "Bifurcation analysis of a mean-field model for biaxial nematics".
- 29-30 October 2009 Liquid Crystal Theory and Modelling Meeting, St Anne's College Oxford (UK)
Oral contribution (invited speaker): F. Bisi: "Steric contributions to ordering potentials in nematic liquid crystals".
- 22-23 April 2010: Workshop 'Modellizzazione matematica di materiali e processi' - Mantua (Italy) (Co-organiser)
Oral contribution: F. Bisi: "Cristalli liquidi nematici: nuove frontiere per la modellizzazione di materiali nanostrutturati".
- 11-16 July 2010: 23rd International Liquid Crystal Conference - Krakow (PL).
Oral contribution: F. Bisi et al.: "Steric effects in a mean-field model for polar nematic liquid crystals"; Poster: F. Bisi, G. Pająk, L. Longa, R. Rosso: "Steric contribution to short range repulsive potential for nonconvex nanoparticles".
- 25-27 March 2013: BLCS Annual Meeting – Cambridge (UK)
Oral contribution: F. Bisi et al.: "Calamitic and antinematic orientational order produced by the generalised Straley lattice model"; Poster: F. Bisi et al.: "Analytical computation of the steric tensor for hard sphaerocylinders".