Seminar – Tuesday, 18th October– 11h00 -
Library Auditorium – NOVA School of Science and Technology, NOVA University Lisbon,
Campus de Caparica, 2829-516 Caparica, Portugal

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Is the author of two-volume Textbooks on liquid crystals and developed extensive research in
many different areas of liquid crystals.

Fertile metastability

After a short remainder about the Frank-Oseen elasticity, we will examine stability of the twist
and splay-bend distortions of the director field and we will discuss remarkable properties of
three metastable systems: 1°- the **dowser texture** [1], 2°- **hypertwisted cholesterics** [2,3,4,5]
and 3°- **hypotwisted cholesterics** [6]**.**

We will focus on generation, motions and collisions of **nematic monopoles** in the dowser
texture (see Fig. 1).

The serial nucleation of **dislocation loops connected by crossings** in a supertwisted cholesteric
shown in Fig. 2 will be examined in terms of the **theory of knots**.

Finally, we will tackle the issue of collisions of dislocations occurring in hypotwisted
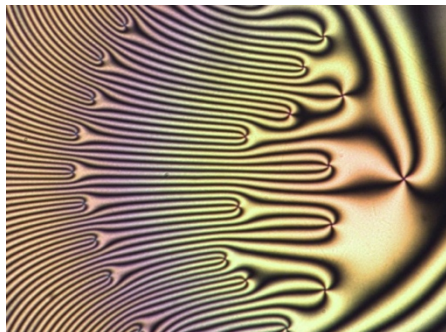cholesterics.

Figure 1: The race of monopoles nucleated
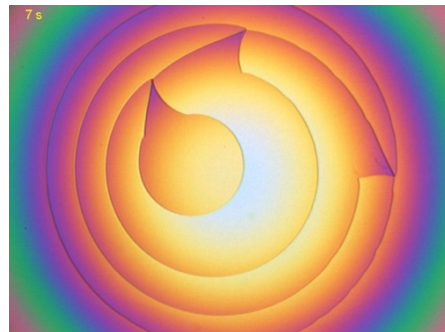in a wound up dowser texture.

Figure 2: Serial nucleation of dislocation
loops in a supertwisted cholesteric.

References:

[1] P. Pieranski and M.H. Godinho, *Liquid crystals, New perspectives,*(ISTE, 2021), p.193.

[2] M. Kleman and J. Friedel, *J. de Physique,* **30 (**C4) 43-53

[3] B. Zappone and R. Bartolino, *PNAS*, **118**, e2110503118 (2021).

[4] P. Pieranski, "*Cholesteric dislocations in mica wedges"* in *Liquid Crystals Reviews* (2022).

[5] P. Pieranski and M.H. Godinho, "*Fertile metastability"* in *Proceedings of the ILCC2022
conference in Lisbon, to be published in Liquid Crystals.*

[6] P. Pieranski and M.H. Godinho, "*Collisions of monopoles, disclinations and dislocations"*
in *Proceedings of the 2022 Geilo School, to be published in EPJST.*

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