



Opening note on the occasion of the 8th IST-IME Meeting, September 5–9, 2022, Instituto Superior Técnico, Lisbon, Portugal, on Ordinary and Partial Differential Equations and Related Topics

Waldyr Oliva¹ 

Accepted: 14 April 2024 / Published online: 3 June 2024
© The Author(s) 2024

1 In Honor of Giorgio Fusco

First let me congratulate the organizers and participants for holding this 8th IST-IME. I regret not being there for health reasons. Special compliments to the honored Giorgio Fusco, an excellent Italian mathematician, my friend, and collaborator.

I met Giorgio Fusco at Brown University nearly 40 years ago when Giorgio was completing his PhD under Jack Hale.

I soon noticed Giorgio's interest in Geometric Mechanics. Then we agreed to go to a meeting in Trieste where we talked a lot about the geometric foundations of Mechanics. We published in collaboration 10 works that are part of this list that Gláucio Terra designed at my request. From 1986 to 2012 we maintained a very strong interaction in my trips to Rome and in Giorgio's trips to Lisbon and São Paulo. We systematically approached the fundamental question of transversality, aiming at Morse-Smale systems in infinite-dimensional dynamics, which were the subject of 3 works: 1988, 1990, and 1991.

In 1993 I went to work at IST after my retirement from USP. In the articles from 1997, 1998 and 2000, we approached questions that arise from physical concepts and that were also considered in the works of 2011 and 2012. At the same time, I worked with Luís Magalhães, Carlos Rocha and Radoslaw Czaja at IST where Fusco's influence was felt. I also started to work with two friends of mine: Gláucio Terra in São Paulo and Marcelo Kobayashi at IST who, without any doubt, made great use of the important collaboration I had had with Giorgio Fusco.

Communicated by Carlos Rocha.

✉ Waldyr Oliva
wamoliva@gmail.com

¹ IST and IME, Lisboa, Portugal

Finally, I would like to thank the present speaker, Gláucio Terra, for the opportunity to exhibit a small work that we offered to Giorgio and to allow, virtually, that I could mention in this IST-IME the unforgettable influence of the collaboration with Giorgio Fusco to whom I send an affectionate hug from here. I still cannot forget to mention the pleasant stay of mine and Angela in his house in Rome and his stay in our house in São Paulo.

Thank you all.

Funding Open access funding provided by FCTIFCCN (b-on).

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

Fusco and Oliva

1. Fusco, G., Oliva, M.: Dissipative systems with constraints. *J. Differ. Equ.* **63**(3), 362–388 (1986). [https://doi.org/10.1016/0022-0396\(86\)90061-6](https://doi.org/10.1016/0022-0396(86)90061-6)
2. Fusco, G., Oliva, W. M.: Jacobi matrices and transversality. In *Dynamics of infinite-dimensional systems (Lisbon, 1986)*, volume 37 of *NATO Adv. Sci. Inst. Ser. F: Comput. Systems Sci.*, pages 249–255. Springer, Berlin, 1987
3. Fusco, G., Oliva, W.M.: Jacobi matrices and transversality. *Proc. Roy. Soc. Edinburgh Sect. A* **109**(3–4), 231–243 (1988). <https://doi.org/10.1017/S0308210500027748>
4. Fusco, G., Oliva, W.M.: Transversality between invariant manifolds of periodic orbits for a class of monotone dynamical systems. *J. Dynam. Differ. Equ.* **2**(1), 1–17 (1990). <https://doi.org/10.1007/BF01047768>
5. Fusco, G., Oliva, W.M.: A Perron theorem for the existence of invariant subspaces. *Ann. Mat. Pura Appl.* (4) **160**(63–76), 1991 (1992). <https://doi.org/10.1007/BF01764120>
6. Fusco, G., Oliva, W.M.: Integrability of a system of N electrons subjected to Coulombian interactions. *J. Differ. Equ.* **135**(1), 16–40 (1997). <https://doi.org/10.1006/jdeq.1996.3171>
7. Fusco, G., Oliva, W.M.: Asymptotic behaviour of a system of repelling particles: asymptotic velocities, phases, scattering operators and integrability. In *International Conference on Differential Equations (Lisboa, 1995)*, pp. 69–81. World Sci. Publ., River Edge, NJ, 1998
8. Fusco, G., Oliva, W.M.: Formation of symmetric structures in the dynamics of repelling particles. *Arch. Ration. Mech. Anal.* **151**(2), 95–123 (2000). <https://doi.org/10.1007/s002050050194>
9. Fusco, G., Negrini, P., Oliva, W.M.: On the stationary motion of a self-gravitating toroidal stratum. *São Paulo J. Math. Sci.*, 5(2), 331–345. (2011) <https://doi.org/10.11606/issn.2316-9028.v5i2p331-345>
10. Fusco, G., Negrini, P., Oliva, W.M.: Stationary motion of a self-gravitating toroidal incompressible liquid layer. *Regul. Chaotic Dyn.* **17**(5), 397–416 (2012). <https://doi.org/10.1134/S1560354712050036>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.