

# Meeting Stanislav

*A Personal Recollection*

Enzo Mitidieri

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I first met Stanislav Ivanovich Pokhozhaev in person at the conference *Reaction Diffusion Systems*, held in Trieste from the 2nd to the 7th of October, 1995. It was, as far as I know, the very first time he had ever set foot in Italy, and for me that meeting had the flavour of a natural culmination — almost of an inevitable destination — of a correspondence that had been building between us for over a year.

It had all started in 1994, when out of the blue I received a letter from Stanislav. He had read my paper on the *Rellich type identity* [1]<sup>1</sup>, published in 1993, and what he wrote was generous and characteristically direct: he liked the work, he saw possibilities in it, and he wanted to collaborate. That kind of letter is rare in academic life. Most of us know the feeling of sending a paper out into what feels like a void; to receive in return a handwritten invitation from one of the great figures of Russian mathematical analysis — someone whose work on nonexistence and a priori estimates you had been studying for years — is something you do not forget.

The correspondence that followed was old-fashioned in the best sense: real letters, real arguments, real mathematics written out by hand and sent across the lingering shadow of the Iron Curtain. We exchanged ideas, sketched strategies, tested each other's intuitions. By the time we finally shook hands in Trieste in the autumn of 1995, we already knew each other's mathematical minds rather well. The conference itself gave us the chance to talk face to face, to work at a blackboard rather than by post, and to discover that the collaboration we had only sketched on paper was entirely real.

We began working together in earnest in 1997, and from that point on the collaboration was a constant thread running through both our mathematical lives. It lasted

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<sup>1</sup>E. Mitidieri, *A Rellich identity and applications*, Rapporti interni N. 25 (1990), Università di Udine, 1–35.

until 2014, the year Stanislav left us — seventeen years of joint work, joint thinking, and what I can only describe as a shared intellectual adventure and a deep friendship.

The easiest way to summarise what we were after is to say that we had a dream in common. It sounds grand, perhaps, but it is the honest word. We wanted to build — or at least to lay the foundations of — a coherent and general theory of nonlinear nonexistence problems. The question of when a nonlinear partial differential equation or inequality *cannot* have a solution, and why, and under what precise conditions: this is a vast and subtle territory, and we both felt that the existing results, however beautiful, were scattered fragments of something larger that had yet to be assembled.

The dream was ambitious. We pursued it through a long sequence of joint papers spanning elliptic and parabolic inequalities, degenerate and singular operators, hyperbolic problems, Liouville-type theorems, capacity methods, and much more.

I should mention one episode in particular, because it captures something true about how mathematics actually gets made. One of the most significant steps forward in our programme — a key idea that genuinely moved things along — came to us not at a desk, not at a blackboard, but on a foggy morning drive from Monfalcone to Trieste, on my way to teach my Mathematical Analysis class. The windows of my Saab were fogged up, and at some point during the journey we found ourselves writing on the condensation of the glass with our fingers, tracing out the argument that was forming in our heads. The fog on the windows turned out to be the perfect blackboard: temporary, immediate, and entirely private. I do not know what passing drivers made of it. We arrived in Trieste, I taught the lecture, and then went straight to write it all down properly before it could disappear like the fog itself. That morning felt, in retrospect, like the moment a lock clicked open.

The centrepiece of the collaboration, in some ways, was our monograph published in 2001 in the *Proceedings of the Steklov Institute of Mathematics* [2] — a long, dense, and I think still useful text that laid out much of the framework we had developed together.

Did we achieve what we set out to do? Partially, I would say, and I mean that word with full awareness of both its modesty and its ambition. We did not complete the edifice; we were not sure anyone could. But we built real walls, and we placed real stones in positions that mattered. The field is richer, I believe, for what we found together, and poorer — very much poorer — for the silence that fell in 2014.

What I remember most, beyond the mathematics, is the spirit of the collaboration. Stanislav was not an easy interlocutor in the sense of being accommodating or vague:

he was precise, demanding, and not easily satisfied with an argument that had a gap. But he was generous in the deepest sense — generous with ideas, with credit, and with the kind of attention that makes you feel your work matters. Working with him made me a better mathematician. Meeting him in Trieste that October was, looking back, one of the most important moments of my professional and personal life.

## References

- [1] E. Mitidieri, *A Rellich type identity and applications*, Commun. in Partial Differential Equations **18**(1–2), 125–151 (1993).
- [2] E. Mitidieri and S. I. Pokhozhaev, *A Priori Estimates and the Absence of Solutions of Nonlinear Partial Differential Equations and Inequalities*, (Russian) Tr. Mat. Inst. Steklova **234** (2001), 1–384; translation in Proc. Steklov Inst. Math., no. 3(234) (2001), 1–362.