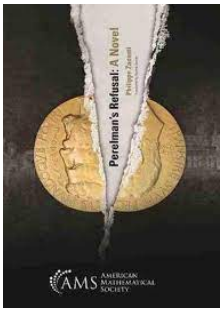
Perelman's refusal: A novel by *Philippe Zaouati*, MAA/AMS, 2021 (x+133 p.), isbn: 978-1-4704-6304-5, translated by Rachel Zerner.



This is an English translation of the French original *Le refus de Grigori Perelman* (Pippa, 2017). Zaouati, is very active in the financial world at French and even European level focusing on sustainable investments. Besides technical books he also wrote some novels, the present one being his third. It is partially based on facts. The Russian mathematician Grigori Perelman who essentially solved a conjecture by Thurston which implied a proof of the Poincaré conjecture. John Ball, president of the IMU, travelled on June 10-12, 2006, to St Petersburg to meet Perelman, trying to convince him to accept his Fields Medal. Perelman refused like he previously refused the EMS Prize in 2001 and later the Clay Millennium Prize of one million in 2010. He retired from the Steklov Institute, broke with all public communication and lives with his mother. Although in 1991, he did accept the St Petersburg MS Prize.

In this novel, the meeting of Perelman and Ball in 2006 is the backbone. Although Zaouati met Ball, the conversations in this book are fantasy. This sounds like an exciting project, however, after reading the result, I am somewhat disappointed. I was expecting some accessible explanation for a general public, if not about the Poincaré conjecture, I was hoping to read somewhat about the motivation of Perelman, or a reasonable explanation of his behaviour. How come, that a brilliant mathematician, after several highly praised contributions, and a sketchy proof of his ultimate result (completed by others), he turned away from all public contacts and probably from mathematics too. The few pictures we have of Perelman are showing a dark bearded Rasputin-like man. He had the reputation of being an autistic character totally devoted to his mother and there are many rumors and legends circling the web about his occupation, whether he completely abandoned mathematics or not, or what his motivation was to refuse. It is said he did not want to be like 'an animal in a zoo' for the international press and that his work on Ricci flows was based on others like R. Hamilton, etc. None or little information feeds legends and stimulates the imagination. So Zaouati had plenty of room to create some acceptable realistic explanation or he could have invented some mythical science-fiction-like story. Unfortunately, he stuck to the few bits that are more or less generally accepted as facts and he describes a meek confrontation between two rather different characters: John Ball, the established president of a 'capitalist' IMU, and Perelman, the revolutionary non-conformist mathematical hermit, product of a totalitarian communist regime, not caring for money, who considers the IMU as a bunch of straightforward conformist mathematicians.

What is described is the meeting of the two, often while they're walking through St Petersburg at a fast pace, Perelman being tall. Perelman is not autistic, well civilized, with experience from research positions in the US. He gives his strong and frank opinion about the mathematics community and how he sees their international meetings as just a charade. His work, he says, is based on the fundamental work of others. They also visit the Steklov Institute showing the sometimes miserable circumstances that people had to work in and yet how they produced top notch results. Zaouatic's only fantasy is that during the night of June 11, Perelman appears to Ball in a dream-like phantasm continuing his arguments of the daytime. Zaouati writes that in this dream Perelman is fluent and self-assured unlike the more stuttering submissive air during the day, but as he describes it, it seems to me that he is as confident during the day as he is during the night.

The book ends with two short chapters. One is dated September 1, 2006, where John Ball reflects on the meeting of the IMU in August and another dated June 9, 2010, when a meeting is taking place at the Poincaré Institute in Paris where Ball is also present with a speech by Valérie Pécresse, minister of education. There the ultimate opinion is raised that the institution of prizes attracts the brightest mathematicians to the subject, and that would prevent them for following their own ideas. Perhaps that is what moved Perelman when he refused.

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