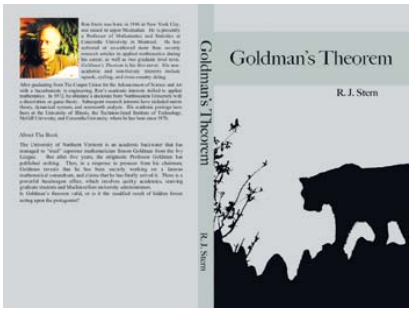
Goldman's Theorem Ron J. Stern, Saga Books, 2008, 220 p., ISBN: 9781897512227.



If you don't know this novel and you know the theorem of Goldman (since such a theorem really exists), forget about the theorem and read the novel. So much more fun! This is about some fictitious Simon Goldman who cracks one of the millennium problems and proves the P = NP conjecture. As is well known, P stands for the set of problems of size n that can be solved in a time that is bounded by a polynomial in n. I.e., they are "easy" to compute. Some problems however require so much time to solve that it would be impossible to ever build a computer in the whole universe that could solve the problem ever. Nevertheless, given a solution of the problem, it might be fairly easy to check that it is indeed a solution. That is an NP problem. So the P vs. NP problem is in fact proving that there do or do not exist problems that are "impossible to solve" but "easy to check". It was originally formulated independently by Stephen Cook and Leonid Levin in 1971 and it has been nominated as one of the seven millennium prize problems by the Clay Mathematical Institute[1] of Cambridge in the year 2000. Each problem is worth one million US dollars. Thus solving this problem would be headline news worldwide like Andrew Wiles proving Fermat's Last Theorem was.

Back to fiction now. Ron Stern, a New Yorker, born in 1946, is currently a professor of mathematics and statistics at Concordia University in Montreal. This is his first novel. It is at the same time hilarious and deeply tragic. The scene is the small "backwater" University of Northern Vermont, near the New York border. Simon Goldman was a young, highly promising mathematician, that had been attracted to the math department using some keen and strategic academic politics orchestrated by his friend Herman Melvin 'Aitch' Singleton (the names 'Gold-man', 'Singleton', etc. are not accidental). So he manoeuvred Goldman into getting the prestigious Von Essen endowment (yes, indeed Prussian aristocrats distributing the money to whoever has the 'right German attitude'), which is a very comfortable research position. Stern gives a sharp insightful sketch of university relations and he describes the hidden agendas and the political courtship dances with a lot of humor introducing quite colorful caricature-like characters. There is the "twin" Nathan Finkelstein and Ibrahim Ibrahim, one is a Zionist Jew, the other a Muslim supporter of the Palestinian cause, both PhD students working somewhere in the dungeons of the department and doing all the slave-work their supervisors do not have time for, and a Chinese student running a take-away restaurant form his room. But most of all there are the academic characters. The chairman Guillermo Slutnick, who is using at least one 'to-be-bleeped-away'-adverb with every noun. Vito de Bernardo is a cycling fanatic with an outspoken preference for Italian cyclist culture. He is in charge of 'Il Gruppo', a cycling group, and leads them like a Mussolini on exhausting tours that are more like survival missions. Margaret Fulton is the dean and a true administrator. She is usually referred to as the Virgin Queen and has a background in British history making her think, behave, and reign like Queen Elisabeth I. Aitch Singleton has an eye on the young assistent professor Celestine Sauvage, but gets a cougar in his backyard (see cover design) who becomes good friends with his cat New-

[1]For more details about the seven millennium prize problems, see `www.claymath.org/millennium/`.

ton. The hilarious situations that Stern describes are of course exaggerated, but nevertheless (unfortunately) quite recognizable. They made me laugh out loud more than once.
When after five years, Goldman has completely disappeared into inertia, not publishing, not going to conferences, colleagues start wondering what is happening, afraid that he is turning into 'deadwood' after all. So, under some pressure, because an evaluation is coming up (and others have to justify them 'stealing away' Goldman five years ago) Goldman tells his friend Singleton that he has 'hit the jackpot', and discovered the 'Holy Grail'. He is just checking the details, but he is almost sure to have solved the above mentioned millennium problem. Some colleague checks the result, and after a local seminar, the word is spread quickly and the whole media circus is brought into position. The department, faculty, and even the whole university is trying to get the best out of this success story. Even the hundred year old Horst Von Essen is invited to the official presentation of that result.
One more key role is for Izzy Fleck, a 'lounge-lizard' fleeing his physics department where 'nobody is interested in mathematical physics'. He hangs around, trying to catch up with string theory (if he isn't falling asleep). So, almost by accident he attends the lecture by Goldman, after which he gets interested in the subject and detects the flaw in the proof which makes the whole argument implode. The usual 'it is obvious that' quote, that nobody had doubted so far, turned out to be not true.
After that the novel takes a much more dramatic turn. Goldman disappears from the campus, and Vito and Singleton go in search for their friend in Vito's Maserati. When Goldman is finally found in New York in the neighborhood where he spent his youth, it becomes clear that he had suffered all these years from a traumatic Vietnam experience. But it would not be an American novel, if there wasn't a happy ending. Goldman returns, now that he is relieved from this haunting experience, and he resumes his work. His proof was actually just a near-mis, and therefore did advance the research in finding the solution.
The reader does not have to know mathematics, although there is some mathematics going on: the 'traveling salesman problem' is used to explain the P vs. NP problem extensively, but along the road, some other topics have a minor role like spherical coordinates, non-smooth analysis, and the geometry of affine cones. Some of the gags may probably be better understood if you know some mathematics.
So if you want a good laugh, you should read the book. If you are deeply involved in university administration or academic politics, you should only read it when you don't take yourself too seriously.

P.S. There has been a poll about P vs. NP problem what people think about it, whether it could be solved or not, and with what techniques. Some well known people have some remarkable answers to it. For example Donald Knuth predicts that it will be finally solved with a $P = NP$ result in either 2048 or 4096, and Dana Nau says that she has found a wonderful and simple proof that $P \neq NP$, but that it unfortunately does not fit into the margin of an e-mail. You can read about the poll at `www.cs.umd.edu/~gasarch/papers/poll.pdf`.

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