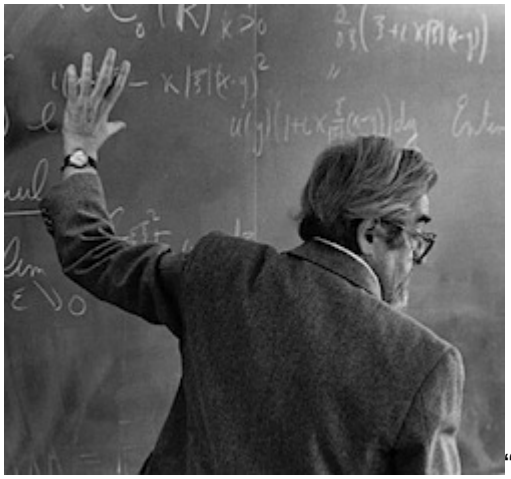
VareseNews

The life of a mathematician: at night, I prove theories, in the morning, I find the mistakes

Pubblicato: Lunedì 16 Giugno 2014



“Hello. I understand Italian.” **Louis Nirenberg**, one of the giants of twentieth-century mathematics (he is an Erdos number 3), feels at home in Italy, because here is what he calls “the big family of mathematicians”, who are gathering in Varese to dedicate three days of study to him. Like all great men of thought, who know how complex the world is, he expresses himself simply, and when he knows he doesn’t know, he calmly admits it. Receiving the **Chern** Medal, a sort of Nobel Prize for mathematics, in **2010**, was the climax of a splendid career, and although **Nirenberg** is already present in the most important publications of contemporary mathematical thought, at the age of 89, he still does not consider himself a part of history. He says he never wanted to change the world with mathematics, but to satisfy an abstract need that is still very present.

Professor Nirenberg, what is the main difference between those who are mathematicians by profession, and those who have a passion for mathematics?
“Talent, which in mathematicians always appears early and is special. It’s not enough to be passionate, you need considerable determination and willpower.”

In Italy, the statistics say that students do rather poorly in mathematics.
“That’s what the statistics say in all countries. It always depends on the quality of the teacher.”

How did you begin?
“My father taught Hebrew, and because of the poor results of his son, he decided to send me for private lessons, and the Hebrew teacher made me solve mathematical puzzles. I didn’t learn Hebrew, but I did learn mathematics.”

How much have computer science and the new technologies changed how young researchers study and investigate mathematical problems?
“There are two answers to your question: the first is that, today, researchers solve problems that look impossible, at a theoretical level, thanks to the calculating power of computers. Then, others do research starting directly with the computer. In the first case, it’s an instrument, in the second, it’s a field of research.”

Do you think Andy Wiles would have found the proof of Fermat's last theorem without the help of computers?
"I couldn't say."

In 1956, you suggested to the future Nobel prize winner, John Nash, he should work on Hilbert's 19th problem. Why did you choose that problem?
"In fact, it was the Italian mathematician, Guido Stampacchia, who pointed it out to me as a question that was still open and interesting. So, I, in turn, pointed it out to Nash, who was looking for new ideas."

That problem was solved by Nash and by the Italian mathematician Ennio De Giorgi, but at different times, and using different methods. Is mathematics created or discovered?
"De Giorgi solved it before Nash, who got there a year later, with a different proof, so today, we speak about the De Giorgi-Nash theorem. On the second question, some say that mathematics discovers new ways of doing things, and others claim that we discover new things. I don't know what's right, it depends on the day; one day, I think one thing, and the day after, I think the exact opposite. I don't think the whole world is mathematical, for example, emotions can't be expressed in mathematics. But I do think there's a close relationship between mathematics and music."

And what is the relationship between mathematics and metaphysics?
"That's a philosophical question, which I'll answer with a little story: there are two university deans, the first says to the second that he has the solution to the problem, that is, to employ mathematicians because they only need paper, a pen and a wastepaper basket. The other replies that he's found a better solution, to employ only philosophers, because they only need paper and a pen."

In *A mathematician's apology*, Godfrey Hardy says that there's no such thing as ugly mathematics, when talking about pure mathematics. Have you ever seen any ugly mathematics?
"Hardy didn't like applied mathematics, and he made a clear distinction. But he couldn't know that some of this studies would have applications today. I can't see such a clear line between them. And if a student never thinks that some proofs are ugly, it means that he's hopeless. I was a student of Richard Courant, who had a unitary view of mathematics."

Describe the typical day of mathematician.
"I work, particularly at night, and sometimes, I'm convinced that I've proved a theory, or found a solution, but my wife always tells me that I'll certainly find a mistake in the morning."

Redazione VareseNews
redazione@varesenews.it