

# LA VANGUARDIA

Published at La Vanguardia the 22/10/2018, by Lluís Amigué

**Margaret Hamilton** programmed the NASA software that took humans to the Moon

**Margaret Hamilton: “Age has taught me not to regard any system as closed, and I’m sure we will be able to remake the current system to avoid destroying the planet. I was born in Indiana. I have a daughter and I became a mother while I was programming the Apollo software. Research is my great love. I have recently been awarded an honorary doctoral degree by the UPC”.**



Photo: Llibert Teixidó

## **THE BACKPAGE**

### **A woman’s brain**

Some people claim that the female brain is less predisposed to mathematics and engineering. They would stop talking nonsense if they ever listened to Margaret Hamilton explain her professor Lorenz’s chaos theory with as much sweetness and clarity as when she describes the day when all the squirrels in the forest gathered in the trees to witness the burial of their playmate Clark, Hamilton’s dog. If someone can unravel the zero-sum logic that unites all the beings in the universe, it will be like Margaret Hamilton sending the first man to the Moon—she

should have sent a few more, she jokes—with her extraordinary capacity for calculation and her smile.

## **“I should have sent a few more men to the Moon.”**

### **Were you a mathematics prodigy?**

I was only a good listener. My father taught philosophy at the Michigan Mining School.

### **What did your father teach you?**

To not believe anything that had not been proven to me.

### **Is that important for programming software?**

There was nothing like software back then, but that is the essence of mathematics.

### **How did you end up programming software?**

Like so many stories in science, my story begins with a great teacher. I was lucky to have Professor Konrad Lorenz as a teacher at the Massachusetts Institute of Technology.

### **The father of chaos theory? The one who talked about a butterfly setting off tornadoes?**

He taught me not just from theory but from experience.

### **What is not experience is information.**

The first assignment that Lorenz gave me was programming a machine called LGP-30 (today a legend in computing) in hexadecimal and binary language.

### **What was the LGP-30 used for?**

For weather forecasting. We were designing weather prediction models.

### **Nowadays these models are used for everything: from the economy to public relations.**

Back then I needed the money to finance my studies, so I had no choice.

### **Was it easy for you to program the LGP-30?**

I found courses on maths and applications easy and enjoyable. But really I was interested in more abstract mathematics.

### **Were there any other women in your area?**

I was Lorenz's only female student.

### **Was that an advantage or a drawback?**

I didn't ever consider it then and I won't consider it now. I never worried about my gender affecting my calculations, I just did them.

**And in your career at NASA?**

When I was asked to collaborate in the SAGE air defence system...

**A big technological challenge in the Cold War.**

...One of my colleagues made some comments. Especially after I became a mother.

**He might have been jealous.**

He reproached me for being there day and night and leaving my baby at home.

**He was definitely green with envy. What was your answer?**

The last thing I told him was "You do as you please and I'll do the same."

**Did NASA hire you from the SAGE programme?**

I saw an advert in MIT's newspaper looking for systems and software engineers to send men to the Moon. And I thought it would be a good idea to send some men I knew far away. In fact, I would have liked to have sent a few more!

**Have you ever regretted getting into this mess?**

It was exciting! We were young and full of enthusiasm; we were working on the greatest adventure ever undertaken by humankind, not just by men. But it wasn't just the big idea itself: our working day was really amusing. I was interviewed by two different teams and both selected me from among dozens of engineers.

**Did you get to choose your team?**

They fought over me. In the end, they tossed a coin. And I was lucky, because I wound up in the team that was designing the software to get the Apollo to the Moon's surface.

**What were computers like back then?**

Enormous. And Marshall machine operators were already afraid of losing their jobs as a result of the evolution of computing.

**Well, nowadays there is full employment in the US.**

To me, the most fun part of all that computing evolution was solving errors. Detecting them, analysing them and solving them. This skill made me stand out.

**Why?**

Mathematicians love problems.

**Did you always have fun at NASA?**

We were always in a good mood and we would do everything together, as if we were on a university campus, which we were, in fact, because we were working for NASA but from MIT in Cambridge.

**Did your family understand your dedication?**

I always had their full support, starting with my husband, who had to warm up lots of bottles for our baby all by himself. But do you know what the best thing was back then?

**I see that there were many.**

There were many: my colleagues, the jokes, the enthusiasm, the fact that the whole country was following the Space Race. But for me it was the machines, the maths, the software and the interface problems that were the most thrilling part. They were a constant source of excitement. Every day we would find out something that nobody had done before. It was about conquering the Moon, but also artificial intelligence.

**What did you do after conquering it?**

I tried to conquer markets: I created my own software company.

**Did it work?**

It worked, because I created one company after another: my goal was always to find a problem for every new technology.

**Did you get rich?**

My life has been and is immensely rich, because I always made money to do things and I never did things to make money.

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