

A black and white portrait of Maria Goeppert-Mayer, a woman with short, dark, curly hair, wearing a dark jacket. The portrait is the background for the entire page.

# Madonna

# of the

# Onion

*An interview with physicist Maria Goeppert-Mayer*

*By Sarah Wright*



# Maria

Goeppert-

Mayer is one of the greatest physicists of our time. She has written several textbooks and won the Nobel prize, all while raising a family. Maria was willing to sit down with us for an interview over a cup of coffee.

Written by  
Sarah Wright

Wright- Let's start at the beginning, with your childhood. What influence did your family have on your later life, specifically your involvement with physics?

Mayer- My entire family has had a love for science and mathematics. I come from generations of university professors. I was born July 28, 1906 and grew up, as an only child, in a home of numbers and equations! My father, Dr. Friedrich Goppert, worked as a professor of pediatrics in Kattowitz, Germany. My father's job caused our family to move to the University of Gottingen, Germany when I was four so that he could work on the campus. My father and I took long walks together, collecting fossils and learning the names of plants. I loved my family very much and

often thought of my father as a role model when I went away to school.

Wright- It is obvious that your father had a great influence on your academic quest. What effect did your mother have on your life?

Mayer- My mother, Maria Wolff Goppert, was a very sophisticated and loving woman. She was a retired teacher of French and the piano. She filled our home with her gift of music. Because of their constant placement in our home, bright and fragrant flowers always remind me of my mother. By watching my mother I learned how to be a polite and well-known hostess. Mother often threw lavish dinner parties for the faculty members at the college where my father was teaching.

Early

Wright- With all your tremendous accomplishments you must have had excellent education throughout the years. What schools gave you your positive edge?

Mayer- As a young adult I attended a small private school for girls, run by female suffragists. I made many friends there, and we all prepared for the university entrance exams. It was pertinent that I go to a

prestigious school because of my family's dream for me to carry on the family tradition. I didn't want to

disappoint them. My school went bankrupt a year before I graduated but I still passed the university entrance exams. In 1924 I began my secondary education at Gottingen, my

*It was pertinent for me to go to a prestigious school... I didn't want to disappoint [my family.]*

father's old teaching grounds! I planned to study mathematics, one of my favorite subjects.

Wright- The world knows you for your physics contributions. How did you decide to change from mathematics to physics?

Mayer- My family was close friends with important scientists, Niels Bohr and my University professor Max Born. I attended many of Born's seminars on physics because of our close

connection. His lectures encouraged me to study physics instead of mathematics. It was a great decision because my work began to have a passion I

had never known before.

Wright- After college you were not in the "lime light" as many of your professors and fellow students presumed you would be. What caused you to lead more of a quiet life immediately after you had found your gift in physics?

Mayer- Near the end of my college career I fell in love with Joseph E. Mayer, or Joe as I prefer to call him, a fellow physicist. We married in 1930 and I devoted myself to being a sunny and agreeable wife. We moved to Baltimore and Joe started working as a professor of chemical physics at Johns-Hopkins. It felt very familiar to be a part of a family living on a university campus. Although I did not have a paying job I did not give up my devotion to physics. I worked in our small attic after I transformed



it into an office for myself. We stayed in our loving home for eight very busy years. My daughter Maria Ann was born and I was dedicated to raising her to be a smart young lady. During this time I completed a textbook and ten papers. I also became pregnant with my second child.

Wright- I understand that you had to suddenly move to Columbia University when Joe lost his job. How did this change your life?

Mayer- While at Columbia I gave birth to my wonderful son, John. I continued working without pay and produced my second textbook, Statistical Mechanics. After my book was

published the Second World War started. During that scary time I worked with Harold Urey

and other physicists on uranium isotope separation. We have nicknamed our work the "Manhattan

Project."

During the war I was also a part of a team working at a secret laboratory in Los Alamos, New Mexico. The other physicists and I

developed the atomic fission bomb. After the War came to a close my family and I followed the physicists to Chicago.



Maria speaks with Enrico Fermi during her time in Chicago

Wright- In the *Windy City* many say you completed your greatest work. It was there that you became a part of the National Academy of Sciences in 1956. What led to that association?

Mayer- I worked both at the Institute for Nuclear Studies and the Argonne National Laboratory. I became obsessed with my work on the nuclear shell model. I was working alone in Chicago but little did I know a man named Hans Jensen was working on the same project in Heidelberg!

Wright- Did you have the chance to meet Mr. Jensen or did the two



Canyons and the mesas and the road to Los Alamos



of you keep your distance to avoid competition?

Mayer- Hans and I met shortly after we had finished our work to share our results. We used our collaborations to publish the book Elementary Theory of Nuclear Shell Structure in 1955. One of the most interesting events of our first encounter was when we discovered we had the exact same birthday. Hans and I have been very good friends ever since!

Wright- With Hans and you living in distant parts of the world it must have been very difficult to write the book together. How did you manage?

Mayer- The writing of the book actually took four years. For that time period Hans came to live with my family and

*me* I. Our effort was worth it. The book has widespread acceptance on both

sides of the Atlantic.

Wright- Your book is known for your "magic numbers". What are those numbers and why are they so magic?

Mayer- While charting the number of protons and neutrons in several elements I noticed that several numbers appeared over and over again. The numbers that I identified were 2, 8, 20, 28, 50, 82, and 126. These numbers are considered "magic" because an element

that has one of these numbers of protons or neutrons is very stable. The magic

numbers played a large role in my nuclear shell model.

Wright- What exactly was your nuclear shell model?

Mayer- While thinking of the nucleus I thought of it as similar to the orbital model of electrons spinning around the nucleus. I thought the nucleus might be something like an onion, with layers of protons and neutrons revolving around each other. My fellow friend and physicist Wolfgang Pauli has nicknamed me the "Madonna of the Onion" for my research.

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Wright- You are now living in San Diego, California. What caused this move from Chicago?

Mayer- In 1960 John and I moved to the University of California. I am now a professor of physics; this is my first full-time paid position. This is

also the first time that a university does not have rules restricting spouses from working at the same university.

Wright- Here in California you have suffered some physical injuries but are still working. What were those injuries?

Mayer- A few years ago I lost the hearing in one of my ears. Soon after moving here I suffered a stroke. My left arm is now paralyzed. I do not often mention my injuries because I do not want others to pity me or dwell on my weaknesses when they think of

me. I want to live a normal life, and I am doing that very successfully and optimistically!

Mayer- Recently (1963) you were awarded, along with Hans Jensen and Eugene Paul Wigner, the Nobel prize for physics on your research of the nuclear shell structure. You are the first woman to win the prize for theoretical physics. What does this accomplishment mean to you?

Mayer- I feel very fortunate to have received this award. It symbolizes my dedication, enthusiasm, and love for physics. I have spent a great

part of my life work making advancements in this field and it was all worth it. To be honest, my work itself was more exciting than winning the prize. I look at this prize as not an ending point in my career but as a stepping-stone to the advancements ahead!

Wright- Well, thank you Maria for your time here today. It has been lovely getting to know you personally.

Mayer- Thank you Sarah. This interview is a gift to me, a chance to share a personal side of myself.

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### Works used for this interview include:

- 1) "Goeppert-Mayer, Maria," Cambridge Biographical Dictionary, p. 600
- 2) <http://www.infoplease.com/ipa/A0882195.html>
- 3) "The atomic Nucleus and Elementary Particles," Biography of Physics, pp. 300 and 301
- 4) <http://www.sdsc.edu/ScienceWomen/mayer.html>
- 5) <http://www.galnet.com/servlet/BioRC?c=1&BA=A.D.&ste=12&docNum=K1631002570...>



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