

## **IEEE/RSE Maxwell Medal Presentation at the Royal Society of Edinburgh**

**\*Citation by Barry Shoop, President-Elect of the IEEE**

**November 12, 2015.**

I will begin by extending my most sincere gratitude to Royal Society President Professor Dame Jocelyn Bell Burnell, to the Fellowship and Staff of the Royal Society of Edinburgh, and to Royal Society Chief Executive Dr. William Duncan, for their warm hospitality and commitment to making this year's Maxwell Award presentation yet another resounding success.

This year marks the 150<sup>th</sup> anniversary of the publication of James Clerk Maxwell's seminal paper, "*A Dynamical Theory of the Electromagnetic Field*." It is a paper that has shaped the global scientific and engineering communities for the past one hundred and fifty years, and continues to shape it even today.

That is why the IEEE/RSE James Clerk Maxwell Award is thus named. James Clerk Maxwell was a 'giant' of our profession, upon whose shoulders numerous generations have stood and seen further, advancing technology to benefit our world. This Award recognizes the 'giants' of our modern era, those extraordinary men and women who have created legacies of accomplishment that will serve to inspire others for generations to come.

Today, on behalf of the more than 426,000 members and Fellows of the IEEE worldwide, it is my great honor to present 2015 Maxwell Medallist and IEEE Fellow Prof. Lynn Conway.

So let me now just spend a little bit of time on the citation:

We recognize Lynn Conway "for contributions to VLSI system design." VLSI, or Very Large Scale Integration, is the process of creating an integrated circuit by combining thousands of transistors into a single chip.

Though we honor and recognize Lynn Conway today for her groundbreaking work in VLSI system design, it is not the sole reason to number her among the giants of our profession.

Lynn Conway is also the creator of the first dynamic instruction scheduler, a breakthrough she accomplished while working on the Advanced Computing Systems project at IBM in the 1960s. The dynamic instruction scheduler has proved to be a seminal invention in computer architecture, and in today's high performance computing systems—some fifty years later—dynamic instruction scheduling is considered a standard technique.

The development of VLSI computing systems stems directly from Lynn Conway's singular and pioneering work in VLSI system design. Of especial significance is her work in the creation and fabrication of multiproject chips, which combined multiple circuit designs into a single chip. These multiproject chips were groundbreaking innovations, dramatically reducing costs, and radically simplifying the process of preparing and submitting chip designs for fabrication.

However, Lynn Conway's work did much more than making chip design simpler and less expensive. Her discoveries made it possible for academic researchers, students, and start-up companies to prototype chips with the same levels of design validation and verification that had been—until Lynn Conway's breakthroughs—the sole domain of commercial efforts.

Changing the way in which chip design occurred was not enough for Lynn Conway. With Dr. Carver Mead, she authored "*Introduction to VLSI Systems*", a foundational work that taught design methods that would enable young engineers to take advantage of this new-found freedom to design and fabricate chips.

As part of this incredible work, Lynn Conway also introduced the concept of lambda scaling, outlining the design rules that would become the cornerstones of a diverse array of CAD tools and design methodologies.

Throughout a long and distinguished career of insight, endeavor, and accomplishment, Lynn Conway has fostered a revolution not only within her profession, but in countless professions that have been able to flourish because of her innovations and discoveries.

I believe that one of her endorsers for the Maxwell Award said it best:

*"Her influence on modern electrical engineering is deep and profound, arguably on the scale of Armstrong and Steinmetz."*

Armstrong, Steinmetz, James Clerk Maxwell—all three are considered giants of our profession, and all three have made contributions to multiple disciplines in ways which continue to echo across space and time.

Similarly, Lynn Conway's work has provided the underpinnings for innovations, discoveries and achievements in every area of scientific and humanitarian study.

On behalf of the IEEE, it is my great pleasure to honor a true giant of our age, Prof. Lynn Conway, with the 2015 IEEE/RSE James Clerk Maxwell Award.

\*Transcription cross-checked by LC using online-video of the event (citation begins at 0:04:00):

<https://www.youtube.com/watch?v=bw2mPAP4XGk>