



## Ainissa Ramirez

*Science evangelist and author*

By Shannon Swilley Greco

He's screaming. Tears are streaming down his face. Oh, the agony. Just as I am composing in my head the "Reasons my son is crying" Tumblr caption (*He stomped on his toy helicopter and is upset it won't fly*), Ainissa Ramirez, science superhero, comes to the rescue!

Well, not in person, but her voice in my head, repeating what she told me in a phone conversation, "Next time something in your house breaks, put it on the kitchen table and operate." All is not lost! My three-year-old wonders why I am suddenly smiling, and he stops crying as I put the helicopter and its pieces on the table. "Let's look inside, sweetie." What transpires over the next 20 minutes (an eternity in preschool terms) is simply amazing. We look at the blades of the propeller. We spin them around a pencil tip. We look at the inside of the wind-up device and find a rubber band. We see a coil of fishing line. We explore the inner workings of the toy and discover what makes it tick. We see how the pieces resemble other things we are familiar with in other contexts. Most surprisingly, the desire to put it back together vanishes, and a new desire appears. "Let's break something else apart!" he squeals. It is a fine line between discovery and destruction with some kids.

This is exactly what Ainissa did herself—she took things apart as a preschooler. Her parents did not see it as destructive. They saw it as curious. Sometimes, she was able to put them back together; sometimes, there were a few "extra" screws. Like so many children, she explored the world around her with a sense of wonder. Like so many scientists and engineers, she was encouraged to do so, and she was exposed to role models in science. And perhaps that makes all the difference.

Her father repaired computers, and Ainissa looked forward to his evening return from work when she rummaged through his suitcase-sized toolkit. Her mother, a nurse, sent her children to the library before a formal afterschool program existed, exposing Ainissa and her brothers to a treasure trove of knowledge. Ainissa's fifth grade science teacher, Ms. Donahue, assigned investigative projects to her students, encouraging them to catalog the trees of Central Park.

Ainissa's advice to young scientists is clear—choose to heed the positive messages in your life that will spur you on in your endeavors. Her own high school guidance counselor suggested she "aim low" in her college applications, but her physics teacher said, "Do me proud." She encourages students to seek out mentors, and this is one way in which the scientific community can contribute to and inspire a new generation of scientists.

She believes all scientists have a responsibility to connect with the general public. Social media today allows even somewhat introverted scientists to engage with a segment of people who "might not have otherwise seriously considered science as a topic of interest, let alone a career path." Ainissa wants as many people participating in

science as possible. "If it's a pipeline, fill it to the point of bursting!"

Ainissa does not call herself a science superhero, even though others might. She calls herself a "science evangelist," spreading the good word about the joys and wonder of science and exploration. When talking to a "science enthusiast" like me, she is certainly preaching to the choir, but she reaches out to all who will listen.

And people do listen ... and read ... and watch. Her podcasts, videos, and popular books make science accessible to the non-scientist. Her book *Newton's Football* merges two seemingly disparate topics—sports and science. Ainissa, herself, was interested in both and saw a pathway to pique the scientific curiosity of sports fans. In the book, she highlights the "crazy" questions that scientists ask, such as "Why don't woodpeckers get concussions?"

"I like to show the audience how smart they are. *Newton's Football* allows people to see the science in their lives, reminding them they are already scientists," said Ainissa. This is the main trend she sees in STEM (science, technology, engineering, and math) education—building on people's natural curiosity. We are getting people to act "more like scientists, getting our hands dirty. We're making things.... We have these wonderful hands; we were meant to create," she said.

In 2015, Ainissa was honored with the Andrew Gament Award from the American Institute of Physics in recognition of her "evangelical" work in making physics accessible to all. At one point, she thought she might be content with a life of research as a Yale professor. But she felt the call. There is a need to inspire the public to find the wonder in the world around them and to use the tools of science to unlock those wonders. Ainissa Ramirez might be a superhero after all.

*Update: We now have a "fix-it" box of broken toys. So far, we have soldered a battery connection for our anteatater-shaped "bug vacuum," realigned wheels of a remote controlled car, and fixed the aforementioned helicopter three (and a half) times.*



Photo credit: James Duncan Davidson/TED.

Shannon Swilley Greco is a program leader in science education at the Princeton Plasma Physics Laboratory.



# 59<sup>th</sup> Electronic Materials Conference

June 28–30, 2017 // University of Notre Dame // South Bend, IN

## PREREGISTER BY JUNE 9<sup>TH</sup> AND SAVE!

The **59<sup>th</sup> Electronic Materials Conference (EMC)** is the premier annual forum on the preparation and characterization of electronic materials. Held June 28–30, 2017 at the University of Notre Dame, this year's Conference will feature a plenary session, parallel topical sessions, a poster session and an industrial exhibition, and immediately follows the Device Research Conference. Mark your calendar today and plan to attend!

### CONFERENCE CHAIR

Jamie Phillips, University of Michigan

### PROGRAM CHAIR

Suzanne Mohney, The Pennsylvania State University

### SCIENTIFIC PROGRAM

The three-day Conference will concentrate on the following topical categories:

#### ENERGY STORAGE AND CONVERSION MATERIALS

- Photovoltaics—Organic and Hybrid
- Solar Cell Materials and Devices
- Thermoelectrics and Thermal Transport
- Energy Harvesting
- Electrochemical Energy Storage and Conversion

#### WIDE-BANDGAP SEMICONDUCTORS

- Group III-Nitrides—  
Growth, Processing, Characterization, Theory and Devices
- Chalcopyrite Semiconductors and Devices
- Silicon Carbide—  
Growth, Processing, Characterization, Theory and Devices

#### OXIDE SEMICONDUCTORS AND DIELECTRICS

- Gallium Oxide
- Oxide Semiconductors—  
Growth, Doping, Defects, Nanostructures and Devices
- Dielectrics for Metal Oxide Semiconductor Technologies
- Epitaxial Oxides and Multifunctional Oxides

#### ORGANIC MATERIALS AND THIN-FILM TECHNOLOGY

- Electronic Materials for Bio
- Organic Devices and Molecular Electronics
- Flexible, Printed and/or Dissolvable Thin Films or Nanomembranes

#### ELECTRONIC MATERIALS SCIENCE AND TECHNOLOGY

- Computational Electronic Materials
- Point Defects, Doping and Extended Defects
- Embedded Nanoparticles and Nanocomposite Films
- Metamaterials and Materials for THz, Plasmonics and Polaritons
- Epitaxial Materials and Devices
- Narrow Bandgap Materials and Devices
- Contacts to Semiconductor Epilayers, Nanostructures and Organic Films
- Materials Integration
- Nano-Magnetic, Magnetic Memory and Spintronic Materials
- Highly Mismatched Bismuthides, Dilute Nitrides and Other Alloys
- Materials for Memory and Computation
- Transparent Conductors

#### NANOSCALE SCIENCE AND TECHNOLOGY

- Graphene, BN, MoS<sub>2</sub> and Other 2D Materials and Devices
- Nanowires and Nanotubes—  
Growth, Processing, Characterization and Devices
- Low-Dimensional Structures—Quantum Dots, Wires and Wells
- Nanoscale Characterization—  
Scanning Probes, Electron Microscopy and Other Techniques

### CONFERENCE VENUE

The University of Notre Dame is consistently ranked among the nation's top 25 institutions of higher learning by *U.S. News & World Report*, *Princeton Review*, *Time* and others. Founded in 1842, Notre Dame stands on 1250 acres considered by many to be the most beautiful property owned by any university in the nation. From the collegiate Gothic architecture and park-like landscape, to exquisite outdoor sculptures and breathtaking views, Notre Dame's campus is a visual splendor. Make some time in your schedule to see the sites. The Basilica of the Sacred Heart, the 14-story Hesburgh Library with its 132-foot-high mural depicting Christ the Teacher, and the University's historic Main Building featuring the famed Golden Dome are among the most widely known university landmarks in the world. The must-see local attractions, coupled with its highly regarded science and engineering programs, make this institution an ideal Conference location.

[www.mrs.org/59th-emc](http://www.mrs.org/59th-emc)



Student participation in this Conference is partially supported by a grant from the TMS Foundation.



EMC 2017 directly follows the 75th Device Research Conference, planned for June 25–28, 2017 at the University of Notre Dame. If interested, please plan your travel arrangements accordingly to allow for attendance at both Conferences.



The 59<sup>th</sup> EMC is managed by

**CONFERENCE SERVICES**  
Because the Experience Matters

[www.mrs.org/conference-services](http://www.mrs.org/conference-services)