Erees Queen MACABEBE

Home Country
Philippines

Degree
PhD in Physics

Expertise
Photovoltaics

Research Focus
Solar Cells and Photovoltaic Modules

Host University
Nelson Mandela Metropolitan University, South Africa

Fellowship Awarded
2006

Erees Queen Macabebe, known to most people as Reese, is the youngest of three children. She grew up in Iloilo City in the Philippines.

She studied at Ateneo de Manila University, earning Bachelor of Science degrees in physics and in computer engineering. While in university Reese joined several student organizations including a scholar's organization where she visited public schools twice a week to give supplementary classes in math and English. She says this outreach effort sparked her passion for teaching. She then became a full-time faculty member in the Department of Physics while pursuing her master's degree in physics education.

Reese is currently completing her PhD at Nelson Mandela Metropolitan University in Port Elizabeth, South Africa. Her work there is focused on photovoltaics, particularly on the investigation of device and performance parameters of solar cells and photovoltaic modules. Solar cells are prone to parasitic resistance. Highseries resistance of a few ohms can degrade device performance, as can low-shunt resistance. Series resistance losses are largely due to bulk resistance of the semiconductor material, metallic contacts and interconnect. This resistance limits the short-circuit current, thereby reducing the maximum power available to the device. Reese's research involves numerical simulation and optimization. Employing well-known solar cell models, she developed a method using Particle Swarm Optimization that allows rapid parameter extraction from current-voltage measurements taken under operating conditions and under standard testing conditions. These parameters provide information about device properties and can be related to its performance. Her photovoltaic research is valuable in device fabrication and analysis of performance losses, which also has potential in developing clean energy systems that can help reduce carbon dioxide emissions.

Reese plans to continue teaching at Ateneo de Manila University in the Philippines.