

# Makita R. Phillips, Ph.D.

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## EDUCATION

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- North Carolina State University** **2014**  
PhD in Mechanical Engineering, Department of Mechanical and Aerospace Engineering;  
Advisor: Justin Schwartz, Ph.D.  
Dissertation: *Effect of Alternative Insulation Materials on Quench Propagation in REBa<sub>2</sub>Cu<sub>3</sub>O<sub>δ-7</sub> Coils*
- Florida Agricultural and Mechanical University** **2011**  
MS in Mechanical Engineering, Department of Mechanical Engineering  
Advisor: Justin Schwartz, Ph.D.  
Thesis: *Influence of Turn-to-Turn Insulation on Quench Propagation in YB<sub>2</sub>C<sub>3</sub>O Coated Conductors*
- Florida Agricultural and Mechanical University** **2007**  
BS in Mechanical Engineering, Department of Mechanical Engineering

## EXPERIENCE

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- American Society of Engineering Education/National Science Foundation SBIR Postdoctoral Fellow** **12/2017-Present**
- Carbice Corporation**
- Oversee research and development of a thermal storage device for electronics cooling
  - Conduct computational simulations for thermal interface materials to depict thermal resistance contributions
  - Interact with customers to provide analysis on the influence of Carbice products on their needs
  - Serve as the main author on Phase I proposals with external collaborators
- California Alliance Postdoctoral Fellow** **8/2016- 12/2017**  
**University of California Los Angeles**
- Designed a thermal energy harvesting device for the waste heat harvesting
  - Determined thermal activation profiles for multiferroic materials
  - Provided computational support for activities related to the Center for Translational Applications of Nanoscale Multiferroic Systems (TANMS)
  - Mentored undergraduate and graduate students in the lab group
- Self-Employed** **8/2014- 8/2016**
- Conducted preliminary hybrid solar module research
  - Developed websites to showcase personal and organizational branding
  - Presented research and graduate school experiences to scientific and non-scientific audiences
  - Participated in CSS, HTML5, COMSOL training
  - Published research activities in IEEE Transactions for Applied Superconductivity

<p><b><i>Graduate Research Assistant</i></b>  <b>North Carolina State University</b>  <b>National High Magnetic Field Laboratory</b></p> <ul style="list-style-type: none"> <li>• Conducted computational analysis of thermal, electrical and structural behavior in various YBCO coated conductors for energy applications</li> <li>• Implemented a unique modeling method in COMSOL to induce thermal behavior</li> <li>• Developed a time-saving thermal destruction detection method</li> <li>• Evaluated the feasibility of incorporating a non-traditional design</li> <li>• Created a new distinguishing method for failure analysis</li> <li>• Results and Analysis used in awarded STTR Phase I</li> <li>• Compiled program reports for quarterly and annual review</li> </ul>	<p><b>8/2010-8/2014</b>  <b>8/2007-5/2010</b></p>
<p><b><i>Research and Development Intern</i></b>  <b>General Electric Company</b></p> <ul style="list-style-type: none"> <li>• Recommended a new finite element modeling (FEM) software package based upon benchmark findings</li> <li>• Collaborated with an international team for the modeling and simulation of a superconducting magnet</li> <li>• Conducted validation of an internal code in parallel with the evaluation of a new software</li> </ul>	<p><b>5/2010-8/2010</b></p>
<p><b><i>Intern</i></b>  <b>Ford Motor Company</b>  <b>2<sup>nd</sup> Tenure</b></p> <ul style="list-style-type: none"> <li>• Communized upper body section parts for vehicle programs and benchmarking efforts</li> <li>• Briefed senior management with benchmark findings and solutions regarding vehicle development</li> </ul>	<p><b>6/2006-8/2006</b></p>
<p><b>1<sup>st</sup> Tenure</b></p> <ul style="list-style-type: none"> <li>• Created an automated program to record vehicle response to road test conditions</li> <li>• Developed a database to contain record testing progress in the dynamometer facility</li> <li>• Completed vehicle test recordings and technician work</li> <li>• Completed tier 2 and SIX Sigma greenbelt training</li> </ul>	<p><b>5/2007-8/2007</b></p>
<p><b><i>Intern</i></b>  <b>National Aeronautics and Space Administration</b>  <b>5/2005-8/2005</b></p> <ul style="list-style-type: none"> <li>• Capability Roadmap Costs brief completed and presented to the division director</li> <li>• Position description for a Contracting Officer's Technical Representative was created and used for hiring practices</li> <li>• Assisted with a classified investigation and conducted research</li> <li>• Met at Johnson Space Center to participate in a classified meeting</li> <li>• Developed final report that was presented to high-ranking officials within the administration</li> </ul>	<p><b>5/2005-8/2005</b></p>

## **PUBLICATIONS**

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Phillips, M.R., Carman, G.P., “Thermomagnetic Energy Harvesting Device Parameter Variance for Efficiency Optimization” (To be submitted Sept 2018)

Phillips, MR, Schwartz J, “The Effect of Non-Traditional Insulation Material on Mechanical Response of REBa<sub>2</sub>Cu<sub>3</sub>O<sub>7- $\sigma$</sub> -based Coils during Cool Down”, *IEEE Transactions on Applied Superconductivity* (Submitted)

Phillips, M.R., Green, C., Cola, B., “Numerical and Experimental Investigation of Vertically Aligned Carbon Nanotube-Phase Change Material Composites for Thermal Management of Electronics”, *2018 17th IEEE Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm)*, San Diego, CA, 2018, pp. 141-146.

Wetzlar, K.P., Keller, S.M., Phillips, M.R., Carman, G.P., “A unifying metric for comparing thermomagnetic transduction utilizing magnetic entropy”. *Journal of Applied Physics*, 2016. **120**(24): p. 244101.

Thomas, L.D., Watt, L. D., Cross, K.J., Magruder, J.A., Easley, C.R., Monereau, Y.A., Phillips, M. R., Benjamin, M.A., “As Purple is to Lavender: Exploring Womanism as a Theoretical Framework in Engineering Education”, *2016 American Society for Engineering Education. ASEE Annual Conference Proceedings*, June 2016, New Orleans, La

Phillips, MR, Chan, WK, Schwartz, J, “Enhanced Quench Protection in REBa<sub>2</sub>Cu<sub>3</sub>O<sub>7- $\sigma$</sub> -based Coils by Inducing Three-Dimension Quench Propagation via Thermally-Conducting Electrical Insulation”, *IEEE Transactions on Applied Superconductivity*, October 2015, vol.25, no.5, pp.1-5, doi: 10.1109/TASC.2015.2452224

Phillips, M.R, *Effect of Alternative Insulation Materials on Quench Propagation in REBa<sub>2</sub>Cu<sub>3</sub>O<sub>7- $\sigma$</sub>  Coils*, Dissertation, August 2014

Schwartz,J., Hunte,F., Chan, W.K., Gou,X.T., Phillips,M.R., Le,Q.V., Naderi,G., Turenne,M, Ye,L., “Status of high temperature superconductor based magnets and the conductors they depend upon”, *IEEE/CSC&ESAS European Superconductivity News Forum (ESNF)* no. 16 ,2011

## **GRANTS AND FELLOWSHIPS**

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AF182-054 Lithium-ion Battery Thermal Runaway Propagation and Containment Solutions	\$147,525	<b>2019</b>
DE-FOA-0001664 Understanding Thermal Energy Harvesting using Magnetic Materials (Submitted)	\$1,000,000	<b>2017-2020</b>
UCLA Sustainable LA Grand Challenge Research Grant (Submitted)	\$125,000	<b>2017-2019</b>
North Carolina State University Doctoral Dissertation Completion Grant	\$16,626	<b>2014</b>
North Carolina State University Diversity Enhancement Grant	\$15,000	<b>2011-2014</b>
Corning Incorporated Fellowship	\$20,000	<b>2008-2010</b>

## **PROFESSIONAL AFFILIATIONS**

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American Society of Mechanical Engineers, Institute of Electrical and Electronics Engineers, National Society of Black Engineers

## **PROFESSIONAL QUALIFICATIONS**

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**Certifications** SIX Sigma Greenbelt Trained, CATIA V5, Digital Buck  
**Skills** Pro-E, MathCad, COMSOL, Maple, ANSYS, OPERA, Matlab, Teamcenter, LabView,

## **HONORS AND AWARDS**

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2017-2019 ASEE/NSF Small Business Postdoctoral Research Diversity Fellow  
2016-2017 California Alliance Postdoctoral Fellow  
2014 Georgia Institute of Technology FOCUS Fellow  
2013 MAE Graduate Student Poster Competition, 2<sup>nd</sup> Place  
2013 ACAAGS Service and Leadership Award  
2012 NSBE Technical Research Exhibition National Competition, 2<sup>nd</sup> Place, Oral  
2010 NSBE Technical Research Exhibition National Competition, 2<sup>nd</sup> Place, Poster  
2008-2009 National Society of Black Engineers' Regional Executive Board Member Impact Award  
2003-2007 Florida A&M University Presidential Scholar

## **EDUCATOR EXPERIENCE**

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***Co-Instructor, Introduction to Engineering Disciplines*** **Fall 2017**  
**University of California, Los Angeles**

- Coordinated and managed undergraduate research projects with Faculty and Graduate Students
- Familiarized students with various computer applications and processes
- Oversaw collaborative student interactions within research and lab teams
- Evaluated research progress and course work
- Cultivated a collaborative environment through internal and external class projects

***Engineering Innovation Instructor*** **Summer 2016**  
**Johns Hopkins University**

- Facilitated an accelerated collegiate engineering course for high school students
- Conducted classroom and laboratory instruction
- Organized and coordinated course logistics with other instructors
- Created and maintained a new course management site

***Lead Instructor*** **9/2015-9/2016**  
**Algebra by 7<sup>th</sup> Grade**

- Directed instructional preparation as well as the development of learning objectives for 20 students in two cohorts
- Tracked the progression of the student population as whole within the ALEKS program
- Developed a dynamic curriculum based upon students progress in the ALEKS programs
- Administered progressive testing to determine students progress in ALEKS and Ab7G

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***SEEK Mentor/Lead Classroom Instructor***

7/2014

**National Society of Black Engineers**

- Taught 23 high school students engineering concepts
- Assisted students in completing a weekly project
- Prepared students for oral and project completion
- Maintained classroom paperwork
- Developed a project curriculum and pre/post camp assessment
- Supported managers in daily operations

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**LEADERSHIP EXPERIENCE*****Student Industry Liaison Officer***

6/2017-Present

***TANMS Engineering Research Center***

- Developed a method for current and former TANMS students and postdocs to connect
- Planned professional development activities for students and postdocs
- Collaborated with the Industry Liaison Officer to foster student/industry connections
- Advocated for student/postdoc interests with the Industry Liaison Officer

***Advisor/Technical Development Chair***

7/2015-8/2017

***Energy Special Interest Group*****National Society of Black Engineers**

- Assisted the Director in strategic organizational planning
- Created member engagement strategies
- Selected and develop technical themes
- Initiated white paper collaborations and publication strategy

***Director of Curriculum Development***

8/2014-4/2018

***Algebra by 7<sup>th</sup> Grade***

- Determined critical areas of development to ensure algebra readiness of 3<sup>rd</sup> graders by the 8<sup>th</sup> grade
- Developed a curriculum to enhance the effectiveness of ALEKS, math education software
- Provided instructors with lesson objectives, goals and activities for subject areas
- Created measurement tools and techniques to determine student progress
- Created and maintain Ab7G website
- Assisted in grant writing to various funding agencies

***National Leadership Institute Chair***

5/2013-5/2015

**National Society of Black Engineers**

- Served as a member of the Board of Directors for the Society
- Oversee the leadership training vision for the National, Regional and Chapter levels of the society
- Manage and provide guidance for the National Leadership Institute Committee
- Create original leadership training content used within the society
- Serve as leadership liaison with other boards (organizations) in the society
- Co-Chair an annual conference for the National and Regional leadership of the collegiate and professional demographics

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- Conduct in-person workshops and webinars for various soft skill training
  - Initiated and developed a leadership curriculum based upon levels of leadership experience
  - Benchmarked various learning management systems where the top choice, SmartTeam, was purchased
  - Revamped the traditional training structure to integrate the SmartTeam Learning Management System

***Minority Engineering Graduate Student Association Student Founder/ Advisor*** **12/2012-Present**  
**North Carolina State University**

- Advised the organization strategy and program implementation
- Created the vision for the organization and year
- Coordinated the organization of professional and social activities
- Promoted the association to the university and minority engineering community
- Developed and implemented member recruitment strategies
- Collaborated with the Director of Minority Engineering Programs

***Mechanical and Aerospace Engineering Graduate Student Association Secretary*** **4/2013-4/2014**  
**North Carolina State University**

- Kept student members aware of MAEGSA events and meeting topics
- Developed publication materials for MAEGSA events
- Managed the MAEGSA social media accounts
- Planned association activities

***Director of Leadership Sustainability*** **6/2012-5/2013**  
**National Society of Black Engineers**

- Developed a method to provide continual support and resources to leaders
- Worked with regional leadership conference chairs to provide content and a timeline/workflow
- Initiated the acquirement of a learning management system

***National Leadership Conference Planning Committee Member*** **4/2011-6/2011**  
**National Society of Black Engineers**

- Served in a committee to facilitate a 5-day leadership training conference for approx. 200 attendees
- Collaborated with Rutherford and Associates to coordinate travel and transportation
- Managed the setup and distribution of A/V equipment

***Chapter Graduate Student Liaison*** **8/2009-3/2010**  
**National Society of Black Engineers**

- Coordinated activities relevant to graduate students at FAMU and FSU
- Planned and implemented NSBE Graduate Student Week for undergraduate and graduate students
- Served as graduate student representative on the chapter executive board

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**Region 3 Public Relations Chair****3/2008-4/2009****National Society of Black Engineers**

- Developed strategic goals based on the direction set by the Regional Chairperson
- Served as the regional representative to the National Public Relations Committee
- Published and disseminated press releases that covered events of the Region
- Coordinated press conferences to publicize events of the Region
- Managed the Regional Public Relations Committee
- Maintained communication and provided support to chapter counterparts
- Instituted innovative methods to publicize regional events that led to a national TV report and record regional conference attendance
- Selected by peers to receive the National Society of Black Engineers' Regional Executive Board Member Impact Award

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**INVITED TALKS AND DISCUSSIONS**

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| Panelist, <i>Maximizing your Ph.D. preparing for academia or industry</i> , National Society of Black Engineers' 44 <sup>th</sup> Annual Conventions, Pittsburgh, PA                | <b>3/2018</b>  |
| Panelist, <i>Non-Traditional Pathways from/to the Tenure Track</i> , 2018 California Alliance Retreat, University of California, Berkeley, CA                                       | <b>3/2018</b>  |
| Phillips, MR, <i>Superconductors: Cold vs. Hot</i> , University of Central Arkansas' Society of Physics Students Seminar  | <b>12/2014</b> |
| Phillips, MR, <i>Networking Luncheon Keynote Address</i> , Region 2 Leadership Conference, National Society of Black Engineers, Richmond, VA  | <b>8/2014</b>  |
| Phillips, MR, <i>Game Tight: Becoming Your Best Professional Self</i> , National Society of Black Engineers' 40 <sup>th</sup> Annual Convention, Nashville, TN                      | <b>3/2014</b>  |
| Phillips, MR, <i>Beef it Up: Strengthening Your Chapter Through Collaboration</i> , National Society of Black Engineers' 40 <sup>th</sup> Annual National Convention, Nashville, TN | <b>3/2014</b>  |