# Makita R. Phillips, Ph.D.

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## EDUCATION

**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 $REBa_2Cu_3O_{\delta-7}$ 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 $YB_2C_3O$ Coated Conductors*

**Florida Agricultural and Mechanical University** **2007**
BS in Mechanical Engineering, Department of Mechanical Engineering

## EXPERIENCE

***California Alliance Postdoctoral Fellow*** **8/2016- Present**
**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

***Graduate Research Assistant***
**North Carolina State University** **8/2010-8/2014**
**National High Magnetic Field Laboratory** **8/2007-5/2010**

- Conducted computational analysis of thermal, electrical and structural behavior in various YBCO coated conductors for energy applications
- Implemented a unique modeling method in COMSOL to induce thermal behavior
- Developed a time-saving thermal destruction detection method
- Evaluated the feasibility of incorporating a non-traditional design
- Created a new distinguishing method for failure analysis
- Results and Analysis used in awarded STTR Phase I
- Compiled program reports for quarterly and annual review

***Research and Development Intern*** **5/2010-8/2010**
**General Electric Company**

- Recommended a new finite element modeling (FEM) software package based upon benchmark findings
- Collaborated with an international team for the modeling and simulation of a superconducting magnet
- Conducted validation of an internal code in parallel with the evaluation of a new software

***Intern*** **6/2006-8/2006**
**Ford Motor Company**
**2nd Tenure**

- Communized upper body section parts for vehicle programs and benchmarking efforts
- Briefed senior management with benchmark findings and solutions regarding vehicle development

**1st Tenure** **5/2007-8/2007**

- Created an automated program to record vehicle response to road test conditions
- Developed a database to contain record testing progress in the dynamometer facility
- Completed vehicle test recordings and technician work
- Completed tier 2 and SIX Sigma greenbelt training

***Intern*** **5/2005-8/2005**
**National Aeronautics and Space Administration**
**5/2005-8/2005**

- Capability Roadmap Costs brief completed and presented to the division director
- Position description for a Contracting Officer's Technical Representative was created and used for hiring practices
- Assisted with a classified investigation and conducted research
- Met at Johnson Space Center to participate in a classified meeting
- Developed final report that was presented to high-ranking officials within the administration

## PUBLICATIONS

Phillips, M.R., Carman, G.P., *Thermomagnetic Energy Harvesting Device Parameter Variance for Efficiency Optimization (*To be submitted Dec 2017*)*

Phillips, MR, Schwartz J, *The Effect of Non-Traditional Insulation Material on Mechanical Response of* $REBa_2Cu_3O_{7-\sigma}$*-based Coils during Cool Down,* IEEE Transactions on Applied Superconductivity (Submitted)

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 $REBa_2Cu_3O_{7-\sigma}$-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 $REBa_2Cu_3O_{7-\sigma}$ 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 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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|---|---|---|
| DE-FOA-0001664 Understanding Thermal Energy Harvesting using Magnetic Materials (Submitted) | $1,000,000 | **2017-2020** |
| UCLA Sustainable LA Grand Challenge Research Grant (Submitted) | $125,000 | **2017-2019** |
| North Carolina State University Doctoral Dissertation Completion Grant | $16,626 | **2014** |
| North Carolina State University Diversity Enhancement Grant | $15,000 | **2011-2014** |
| Corning Incorporated Fellowship | $20,000 | **2008-2010** |

## PROFESSIONAL AFFILIATIONS

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, 2nd Place |
| 2013 | ACAAGS Service and Leadership Award |
| 2012 | NSBE Technical Research Exhibition National Competition, 2nd Place, Oral |
| 2010 | NSBE Technical Research Exhibition National Competition, 2nd Place, Poster |
| 2008-2009 | National Society of Black Engineers' Regional Executive Board Member Impact Award |
| 2003-2007 | Florida A&M University Presidential Scholar |

## INSTRUCTOR EXPERIENCE

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

- Coordinated and manage undergraduate research projects
- Familiarized students with various computer applications and processes
- Oversaw collaborative student interactions within research and lab teams

***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$^{th}$ 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

***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

## 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-Present**
***Algebra by 7th Grade***

- Determined critical areas of development to ensure algebra readiness of 3rd graders by the 8th 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
- 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

***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

**INVITED TALKS**

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| Phillips, MR, *Superconductors: Cold vs. Hot*, University of Central Arkansas' Society of Physics Students Seminar | **12/2014** |
| Phillips, MR, *Networking Luncheon Keynote Address,* Region 2 Leadership Conference, National Society of Black Engineers, Richmond, VA | **8/2014** |
| Phillips, MR, *Game Tight: Becoming Your Best Professional Self*, National Society of Black Engineers' 40th Annual National Convention, Nashville, TN | **3/2014** |
| Phillips, MR, Beef it Up: Strengthening Your Chapter Through Collaboration, National Society of Black Engineers' 40th Annual National Convention, Nashville, TN | **3/2014** |