THE SAMSA MASAMU PROGRAM

The Fifth Annual Masamu Advanced Study Institute (MASI) and Workshops in Mathematical Sciences

November 20^{th} - 29^{th}, 2015

University of Namibia
Windhoek, Namibia
ACKNOWLEDGEMENTS

The Masamu program expresses our appreciation to the following sponsors:

The program wishes to extend its special thanks to the following individuals in the Auburn University Office of Diversity and Multicultural Affairs:

Sue Fuller, Executive Assistant/Business Manager
Keri Hesson, Executive Support Specialist
Brittany McCullough, Diversity Analyst, Planning & Assessment
Ashley Smith, Special Projects Administrator
THE SAMSA MASAMU PROGRAM

The Masamu (masamu means mathematics in Southern Africa) Program was established in 2010 through a grant from the US National Science Foundation (NSF). The primary goal of the program is enhancing research in mathematical sciences within Southern Africa Mathematical Sciences Association (SAMSA) institutions through promotion of international research collaboration. A key component of the Masamu Program is the Masamu Advanced Study Institute (MASI) and Workshop Series in mathematical sciences that provides a platform for such collaboration. Other planned activities include Research Workshop, Career Development Workshop, Department Heads and Chairs and Senior Research Scientists Workshop, Colloquia and Webinar Series, and AfricaMath. The target audiences of the MASI are graduate and undergraduate students and early career faculty (rank less than associate professor) while the workshops are open to students, faculty, and other researchers in the mathematical sciences.

The Masamu Advanced Study Institute (MASI) and Workshop Series in Mathematical Sciences program is a collaborative effort between African, European, Canadian, and US mathematicians. This program has three main goals: (1) Strengthen the US and Southern African human infrastructure in mathematical sciences research; (2) Drastically increase and sustain research collaboration between US, European, and Southern African mathematicians; and (3) Improve collaboration between US, European and Southern African colleges and universities.

In order to effectively use the MASI and Research Workshops, the Masamu Program has created a Collaborative Research Network consisting of 55 research faculty (26 Sub-Saharan Africa, 21 US, 2 Canada, and 6 Europe) forming 4 research teams in Pure Mathematics (Algebra and Geometry, Analysis and Topology, Coding Theory and Information Theory, and Graph Theory) and 4 research teams in Applied Mathematics (Epidemiological Modeling, Numerical Approximation of Solutions of Partial Differential Equations, Mathematics of Finance, and Statistics). Each research team has at least 4 faculty and at least 4 undergraduate and graduate students. The primary objectives of the network are to drastically increase both the quantity and quality of research publications and the number of PhD degrees, especially among women and underrepresented minorities, in each of the areas represented by the eight research teams in both the US and Sub-Saharan Africa, and promote research collaboration between European, Sub-Saharan Africa, and US mathematicians. Participants in this Collaborative Research Network take advantage of the annual SAMSA conferences, Masamu Institutes, and Workshops to meet face to face, work on research problems, plan research activities for the following year, and present their research findings.

About SAMSA: The Southern Africa Mathematical Sciences Association (SAMSA) was established in 1981 to further the mathematical sciences in the Southern African region (Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe) and beyond.

About the NSF: The National Science Foundation (NSF) is an independent US federal agency created by Congress in 1950 "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense..." In many fields such as mathematics, computer science and the social sciences, NSF is the major source of federal backing for America’s colleges and universities.

Institute and Workshop inquiries should be directed to:
Sub-Saharan Africa - Dr. Moatlhodi Kgosimore, mkgosi@bca.bw
United States - Dr. Ash Abebe, abebeas@auburn.edu

General inquiries about the Masamu Program should be directed to:
Sub-Saharan Africa - Dr. Edward Lungu, lunguliz@gmail.com
United States - Dr. Overtoun Jenda, jendaov@auburn.edu
| **2015 Advanced Study Institute and Research Workshop Program**  
| **Senior Research Faculty** |
| --- | --- | --- |
| **Dr. Ash Abebe**  
Professor  
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Statistics |  |
| **Dr. Charles Chidume**  
Professor  
cchidume@aust.edu.ng | African University of Science and Technology  
Analysis and Topology |  |
| **Dr. Levis Eneya**  
Senior Lecturer  
leneya@cc.ac.mw | University of Malawi  
Analysis and Optimization |  |
| **Dr. Jean-Baptiste Gatsinzi**  
Associate Professor  
jgatsinzi@unam.na | University of Namibia  
Algebraic Topology |  |
| **Dr. Overtoun Jenda**  
Professor and Associate Provost for Diversity & Multicultural Affairs  
jendaov@auburn.edu | Auburn University  
Algebra |  |
| **Dr. Peter Johnson**  
Professor  
johnspd@auburn.edu | Auburn University  
Discrete Mathematics: Graph Theory, Information Theory |  |
## 2015 Advanced Study Institute and Research Workshop Program
### Senior Research Faculty

<table>
<thead>
<tr>
<th>Image</th>
<th>Name</th>
<th>Position/Title</th>
<th>Institution/Contact Information</th>
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<tbody>
<tr>
<td><img src="image1.jpg" alt="Image" /></td>
<td>Dr. Moatlhodi Kgosimore</td>
<td>Senior Lecturer</td>
<td>Botswana College of Agriculture</td>
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<td>Mathematical Biology</td>
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<tr>
<td><img src="image2.jpg" alt="Image" /></td>
<td>Dr. Suzanne Lenhart</td>
<td>Professor</td>
<td>University of Tennessee</td>
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<td><img src="image3.jpg" alt="Image" /></td>
<td>Dr. Edward Lungu</td>
<td>Professor</td>
<td>Botswana International University of Science &amp; Technology</td>
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<td>Mathematical Biology, Stochastic Analysis</td>
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<td><img src="image4.jpg" alt="Image" /></td>
<td>Dr. Farai Nyabadza</td>
<td>Professor</td>
<td>Stellenbosch University</td>
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<td><img src="image5.jpg" alt="Image" /></td>
<td>Dr. Abdul-Aziz Yakubu</td>
<td>Professor</td>
<td>Howard University</td>
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<td><img src="image6.jpg" alt="Image" /></td>
<td>Dr. Muhammad Zaman</td>
<td>Associate Chair and Professor</td>
<td>Boston University</td>
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<td>Mathematical Biology</td>
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## 2015 Advanced Study Institute and Research Workshop Program Participants

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<tr>
<th>Name</th>
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<th>Research Group</th>
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<tr>
<td>Johnathan Barnett</td>
<td>Auburn University</td>
<td>Graduate Student</td>
<td>Graph Theory</td>
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<td>Usman Bello</td>
<td>African University of Science and Technology</td>
<td>Lecturer</td>
<td>Analysis and Topology</td>
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<td>Adam Blumenthal</td>
<td>Auburn University</td>
<td>Graduate Student</td>
<td>Graph Theory/Algebra</td>
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<td>Hannah Correia</td>
<td>Auburn University</td>
<td>Graduate Student</td>
<td>Statistics</td>
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<td>Matthew DeVilbiss</td>
<td>University of Dayton</td>
<td>Undergraduate Student</td>
<td>Graph Theory</td>
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<td>Sylvie Djiomba Njankou</td>
<td>Stellenbosch University</td>
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<td>Christina Edholm</td>
<td>University of Nebraska-Lincoln</td>
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<td>Bradley Fain</td>
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<td>Aziza Iddi</td>
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<td>Cadavious Jones</td>
<td>Alabama State University</td>
<td>Assistant Professor</td>
<td>Graph Theory</td>
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<td>Edna Jones</td>
<td>Rose Hulman Institute of Technology</td>
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<td>Tefo Kaisara</td>
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<td>Roselyn Kaondera-Shava</td>
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<td>Enock Koga</td>
<td>University of Namibia</td>
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<td>Khumbo Kumwenda</td>
<td>Mzuzu University</td>
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<td>Scott LeFevre</td>
<td>Norwich University</td>
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<td>Ben Levy</td>
<td>University of Tennessee</td>
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<td>Ryan Matzke</td>
<td>University of Minnesota</td>
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<td>Isabel Moyo</td>
<td>National University of Science and Technology</td>
<td>Graduate Student</td>
<td>Financial Mathematics</td>
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<td>Winifred Mutuku</td>
<td>Kenyatta University</td>
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<td>Mathematical Biology</td>
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<td>Furuzan Ozbek</td>
<td>Auburn University</td>
<td>Postdoctoral Student</td>
<td>Algebra</td>
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<td>Notice Ringa</td>
<td>Botswana International University of Science &amp; Technology</td>
<td>Lecturer</td>
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<td>Patrick Sawerengera</td>
<td>University of Malawi</td>
<td>Graduate Student</td>
<td>Graph Theory</td>
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2015 MASAMU ADVANCED STUDY INSTITUTE (MASI) AND RESEARCH WORKSHOP
FRIDAY, NOVEMBER 20 - SUNDAY, NOVEMBER 29, 2015
DAILY SCHEDULE

MASI AGENDA
Friday, November 20 – Friday, November 27

Day 1: Friday, November 20 - Hilton Windhoek Hotel
02:00 – 06:00  Registration
04:00 – 06:00  Research Team Leaders Planning Sessions
06:00  Dinner and Networking

Day 2: Saturday, November 21 - Hilton Windhoek Hotel
09:00 – 09:20  Welcome and Introductions
09:20 – 10:20  Overview of Program, Logistics, Expectations
10:20 – 10:40  Break
10:40 – 12:00  Research Group Problem Sessions
12:00 – 01:30  Lunch
01:30 – 02:50  Research Group Problem Sessions
02:50 – 03:10  Break
03:10 – 04:30  Research Group Problem Sessions
04:30 – 06:00  Recap
06:00  Dinner and Networking

Day 3: Sunday, November 22 - Hilton Windhoek Hotel
09:00 – 10:20  Research Group Problem Sessions
10:20 – 10:40  Break
10:40 – 12:00  Research Group Problem Sessions
12:00 – 01:30  Lunch
01:30 – 02:50  Research Group Problem Sessions
02:50 – 03:10  Break
03:10 – 04:30  Research Group Problem Sessions
04:30 – 06:00  Recap
06:00  Dinner
07:00  SAMSA Conference Cocktail at Safari Hotel
Day 4: Monday, November 23 - University of Namibia
09:00 – 02:00  SAMSA Conference*/Lunch
02:10 – 03:30  Research Group Problem Sessions
03:30 – 03:50  Break
03:50 – 05:10  Research Group Problem Sessions
05:10 – 05:40  Recap
06:00  Dinner and Networking

Day 5: Tuesday, November 24 - University of Namibia
09:00 – 02:00  SAMSA Conference*/Lunch
02:10 – 03:30  Research Group Problem Sessions
03:30 – 03:50  Break
03:50 – 05:10  Research Group Problem Sessions
05:10 – 05:40  Recap
06:00  Dinner and Networking

Day 6: Wednesday, November 25 - University of Namibia
09:00 – 02:00  SAMSA Conference*/Lunch
02:10 – 03:30  Research Group Problem Sessions
03:30 – 03:50  Break
03:50 – 05:10  Research Group Problem Sessions
05:10 – 05:40  Recap
06:00  Dinner and Networking

Day 7: Thursday, November 26 - University of Namibia
09:00 – 10:20  Research Group Problem Sessions/SAMSA Conference*
10:20 – 10:40  Break
10:40 – 01:00  Research Group Problem Sessions/SAMSA Conference*
01:00 – 02:00  Lunch Break
02:00 – 05:00  Game Drive – Heja Lodge
06:00  Conference Dinner – Heja Lodge

Day 8: Friday, November 27 - University of Namibia
09:00 – 02:00  SAMSA Conference*/Lunch

*MASI research groups may meet at this time depending on the SAMSA conference agenda.
Day 8: Friday, November 27 - University of Namibia
02:10 – 03:30 Research Presentation and Discussion
03:30 – 03:50 Break
03:50 – 05:10 Research Presentation and Discussion
05:10 – 05:40 Recap
06:00 Dinner and Networking

Day 9: Saturday, November 28 - Hilton Windhoek Hotel
09:00 – 12:00 Working Groups Future Research Activities Planning Sessions
12:00 – 01:00 Lunch on your own
01:00 - 06:00 Break
06:00 Dinner on your own

Day 10: Sunday, November 29 - Hilton Windhoek Hotel
08:30 – 10:00 Presentation of Research Progress Made and Future Research Activities
10:00 – 11:30 Networking/Hotel Check Out
11:30 – 12:30 Lunch and Closing Remarks
12:30 Depart for Windhoek Airport
02:55 Depart Namibia
### MASAMU PROGRAM STEERING COMMITTEE

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<tr>
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