

ACTIVITY REPORTING FORM

FOR CDC GRANTS PROGRAM

IMU Simons African Fellowship Program

Name of grantee: **JOB BONYO**

Home institution and country of grantee: **MASENO UNIVERSITY, KENYA**

Name of the host: **PROF. ARISTOMENIS G. SISKAKIS**

Name of the host institution and country: **ARISTOTLE UNIVERSITY OF THESSALONIKI, GREECE**

Topic of the research activity: **COMPOSITION SEMIGROUPS ON SPACES OF ANALYTIC FUNCTIONS OF THE UPPER HALF PLANE**

Dates spend at the center/host institution: **15/01/2019 – 15/02/2019**

The period from 15/01/2019 to 15/02/2019 has been an enriching one in my academic and professional career, courtesy of the IMU-Simons African fellowship award. During my first week in Thessaloniki, I got introduced to the Mathematical Analysis section group of the Department of Mathematics, Aristotle University of Thessaloniki, headed by my host Prof. Aristomenis G. Siskakis. This team, I have to point out, consists of very knowledgeable, dynamic and passionate Mathematicians and I greatly benefited from every discussions/meetings we had. I then gave a brief talk about my previous research as well as the intent of my visit.

During the same week, I managed to complete a paper that I had started working on with my student back in Kenya. The paper titled, "Duality of the nonreflexive Bergman space of the upper half plane and Composition groups" is currently available in preprint form at <https://arxiv.org/abs/1901.07780>.

For the remaining period of my stay, together with the team, we focussed on the study of composition operators on the spaces of analytic functions of the half plane. We characterized all the semigroups of self-analytic maps of the upper half plane based on the location of the Denjoy-Wolf point and established the associated univalent functions. We then considered the induced composition operator groups on analytic spaces of the upper half plane including Hardy spaces, Bergman spaces and the Dirichlet space. For the cases where the composition groups are bounded, we determined semigroup properties.

Moving forward, we plan to complete the spectral analysis of the infinitesimal generators and the resolvent functions which will be obtained as integral operators. We then intend to study the generalization of these integral operators on the analytic spaces of the half plane.

For the future, we plan to collaborate in a number of ways including but not limited to: Research on emerging problems in the area of composition operators; Advising of postgraduate students; Attending some upcoming international conferences together, among others.

Finally, I wish to heartily thank the IMU-SIMONS AFRICAN FELLOWSHIP fraternity for sponsoring my visit.

With my signature I agree that my Activity Report and pictures can be published on the CDC website.