Stellenbosch
UNIVERSITY
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DATA SCIENCE AND COMPUTATIONAL THINKING
INZULULWAZI NGEDATHA NENGQIQO YOKUBALA
DATAWETENSKAP EN REKENAARDENKE

Please join us for a colloquium presented by **Prof. Martin Bucher**, Laboratoire APC, Université Paris Cité/CNRS; NITheCS; and School of Data Science and Computational Thinking, Stellenbosch. Please note, this is not a technical talk but one that is accessible to all science enthusiasts.

Cosmology and Computation:
Challenges for Mapping the Early Universe

Abstract: Substantial progress has been made on mapping the early universe. Observations of the cosmic microwave background temperature and polarization anisotropies now provide a precise characterization of the primordial fluctuations that grew through gravitational instability to become the structures that we observe in the universe today, and efforts are underway to detect the primordial gravitational waves predicted to have been generated during cosmic inflation. Presently much effort is being devoted to mapping the subsequent Dark Ages, Cosmic Dawn, and Age of Reionization through radio observations using the 21 cm hyperfine transition of atomic hydrogen. Both types of observations involve extracting a minute signal from noise, both instrumental and from foregrounds. I will describe some of the computational challenges in this endeavor reviewing both current solutions and open problems.

Date/Time: 31 August 2023 at 12h30 for 13h00. Expected end at 14h00.

Venue: Online, or in-person at School for Data Science and Computational Thinking, African Centre for HIV/ Aids Building, Cnr of Banghoek and Joubert Street, Stellenbosch University.

RSVP: All attendees to register on https://maties.zoom.us/webinar/register/WN_foiEDBKyQ22pzUvr3EPepA.

Those attending in person, please register online and email dataschool@sun.ac.za to inform us that you will be attending. In person registration deadline 30 August 2023

Bio: Martin Bucher is currently (since 2004) CNRS Directeur de Recherche based at Université Paris Cité and now also holds a fractional appointment at Stellenbosch in the School of Data Science and Computational Thinking. Bucher was part of the European Space Agency Planck Collaboration, which mapped out the microwave sky in temperature and polarization. Bucher received his PhD in Physics from Caltech in 1990, and after postdoctoral positions at the Institute for Advanced Study, Princeton University, Stony Brook University, and the University of Cambridge, became SW Hawking Fellow of Mathematical Sciences at DAMTP and Trinity Hall, Cambridge. Bucher has made extensive contributions to theoretical and observational cosmology. Bucher was awarded the Gruber Prize in Cosmology as part of the Planck team.