

---

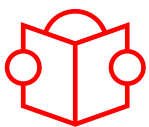
## Brandon BISSCHOFF

University of KwaZulu-Natal, South Africa



Research field  
**Astrophysics**

PhD title  
**The inter-galactic magnetic  
field (IGMF): Simulations and  
Observational Probes**



### Keywords

- intergalactic magnetic field
- 21cmFAST
- magneto hydrodynamic simulations
- MeerKAT
- SKAO

### Summary

The inter-galactic magnetic field (IGMF) is the weakest predicted magnetic field in the Universe but should permeate through the entire Universe. The IGMF may be used as a probe of the Big Bang, since it has very likely not undergone a strong amplification like the magnetic field in denser regions of the Universe. Currently, however, direct measurements of the IGMF strength have not been obtained.

First, we will simulate the IGMF and test these simulations to obtain a better understanding of its properties, as well as of the early sub-galactic structure formation and the epoch of re-ionization that are sources of magnetic fields. Second, we aim to obtain more robust, accurate and consistent constraints on the IGMF through a combined simulation and observation approach.



**Supervisor**  
**Prof. Ma YIN-ZHE**  
University of  
KwaZulu-Natal



**Co-supervisor**  
**Prof. Jean-Paul  
KNEIB**  
EPFL