

Brand:

*Atmospheric process  
studies and modelling*

# Computing: Meteorology

## Themes and Targets: 2018 - 2022

The computer centre	Personal computing	Software
Study and model atmospheric processes	High-end computing laptops and desktop computers for modelling and analysis	Hands-on analysis routines for synoptic configurations
Store and manage large data volumes, including data from geostationary satellites and 3-D model simulations	Remote access to personal computers and computer centre through TeamViewer	Data-driven modelling on a range of forecast time scales and applications
Development and testing of components of atmospheric models such as parameterization schemes		
Atmospheric pollution research and modelling		
Hosting of full-time MSc, PhD and Postdoc students		

# Research and Development: Meteorology

## Themes and Targets: 2018 - 2022

Key Strategies	Observations and Fundamental Processes	Short-term Weather Forecasting Techniques and Synoptic Systems	Weather and Climate Modelling
Process studies	Diagnostics of observed and model data; Apply and develop analysis techniques; Extreme event analysis and attribution studies; Annual cycle and general circulation in troposphere and stratosphere; Obs uncertainty	Hail climatology and synoptic circulation; Analysis of high impact (e.g. heavy rainfall) events	NWP model for research purposes; Idealised models; SOMs/PCA/CCA
Forecasting techniques	Application of quasi-geostrophic analysis	Hail forecasting; High impact event forecasting; Applying atmospheric profile and satellite data in forecasting	Statistical downscaling; Application of S2S and NMME hindcasts, and CMIP5 and CORDEX projections
Modelling	Improved understanding of established/known drivers of the local climate and identifying new ones	Post-processing of NWP model output; Tailoring forecasts; Understanding forecast uncertainties	Data-driven modelling; Drought prediction; Statistical SST and sea-ice modelling; Verification; Applications

**DAYS TO DECADES**

National and “Westward South-South” and North-South Collaboration; Generate Research Funding

# Teaching Activities: Meteorology

## Themes and Targets: 2018 - 2022

BSc and BSc (Honours)	Air Quality Management	Post-graduate Supervision
WMO compliant	Identification of suitable expertise to assist with teaching and supervision	Strong alignment with research and development themes
New and modified lecture material	Development of appropriate research topics	15 MSc and 7 PhD graduated
Mathematical and computer solving approaches		Student exchanges from countries with political and developmental similarities, as well as with developed countries
Introducing Climate Change concepts and numerical modelling into curricula		Full-time students and postdocs
		20 peer-reviewed papers