Professor Claude Carignan

University of Cape Town

Claude Carignan did his PhD (1983) at Mount Stromlo and Siding Spring Observatory of the Australian National University where he pioneered the multi-component analysis technique of galaxy's rotation curves using both radio HI and optical Ha kinematical data. He pursued his formation in HI radio synthesis work by a postdoctoral fellowship (1985) at the Rijksuniversiteit in Groningen using data from the Westerbork array. He then moved to the Université de Montréal in 1985 as a research associate and became full professor in 1998. During those years, he continued his studies of the mass distribution in galaxies using at radio wavelengths the Very Large Array (VLA), the Australia Telescope Compact Array (ATCA) and the Dominion Radio Astronomy Observatory (DRAO) and at optical wavelengths using Fabry-Perot Ha interferometry at the CFHT, ESO La Silla, WHT, OHP and OMM.

In 1998, he took over the directorship of the Observatoire du mont Mégantic Research Centre and in 2002 became director of the Observatoire du mont Mégantic (OMM). More recently (2007), he became adjunct professor at the Université de Ouagadougou, in Burkina Faso, where he has set up an Astrophysics program and built a small Observatory for teaching purpose. At the end of 2009, he moved a telescope from Chile to Burkina Faso and the construction of the new research Observatory is under way and should be completed in 2012. Finally, on July 1st, he just started a South African Research Chair in Multi-wavelength Astronomy at UCT.

Plenary Lecture:
Mass Distribution in Galaxies using Multi-Wavelength 3D Spectroscopy

Spiral and dwarf galaxies are known to present an important mass discrepancy between their dynamical and visible masses. The commonly accepted hypothesis is to assume a more or less spherical halo of unseen matter in addition to the stars and gas. To study properly this mass discrepancy, different observational techniques at different wavelengths need to be combined in order to probe as best as possible the gravitational potential at all radii and different theoretical tools are necessary to sort out which distribution law represents best the dark matter component.

This Multi-wavelength approach will be illustrated by discussing the radio HI aperture synthesis observations of our Local Group neighbours, M31 (Andromeda) and M33 and the optical Ha Fabry-Perot interferometric observations of the SINGS sample of galaxies. As an example, it will be showed how important it is to model properly velocity perturbations, such as those produced by bars, before using the kinematics to derive the gravitational potential as a tracer of both the luminous and the dark matter components.