

**Talk ID: Sci**

Submitted by: Jaron Kurk

Partner: LBTB

Instrument (for science papers): LUCI

**LUCI spectroscopy of distant galaxies**

J. Kurk and the MPE LUCI team

**Abstract**

We have used LUCI for a variety of spectroscopic observations of distant galaxies. LUCI multi object (MO) spectroscopy was used to measure strong emission lines in a large sample of  $z \sim 2$  galaxies. These data allow us to assess the evolution of the mass-metallicity relation and its dependence on star formation rate (SFR). For a subsample, we

study the impact of active galactic nuclei, shocks and photoionization on the excitation properties. We also used LUCI as pseudo integral field spectrograph in long slit and MO spectroscopy mode. Combined with CO and HST-based optical data, we compare the spatial distribution and kinematics of the ionized and molecular gas in a galaxy at  $z=1.53$ . For the first time at high redshift, we measure the spatially resolved (Kennicutt-Schmidt) relation between the surface densities of cold gas and star formation. Finally, we use the versatility of LUCI to observe lensed galaxies at  $z > 2$  with curved slits matched to the lens morphology and present two such galaxies with very different excitation properties.

**Talk ID: Sci**

Submitted by: Fabrizio Fiore

Partner: INAF

Instrument (for science papers): PISCES

**LBT/AO observations of AGN**

F. Fiore, A. Bongiorno, C. Arcidiacono et al.

**Abstract**

We will present and discuss LBT/AO/Pisces observations of a few nearby and high-z AGN.

We exploited LBT/AO to obtain high quality, sub-arcsec resolution NIR maps of the nuclear, diffuse emission of Mrk231, an ULIRG hosting the highest luminosity QSO in the local Universe. Massive molecular and ionized gas outflows were discovered in this AGN on kpc scales ( $\sim 1$ arcsec). The goals of the LBT NIR observations (joined with HST optical maps) are: a) search for dust lanes on scales from 0.1 to a few arcsec, and b) estimate the age of the stellar population in the galaxy.

We will also discuss the use of LBT/AO observations of high-z QSOs to constrain fundamental physics. Indeed, quantum space-time scenarios predict a degradation of the diffraction images of distant sources. LBT may produce images sharper than all present instrumentation, helping in further exploring the fuzziness induced by quantum space-time.

**Talk ID: Sci**

Submitted by: Kevin Croxall

Partner: OSU

Instrument (for science papers): MODS

**CHAOS: The Chemical Abundance Of Spirals**

Croxall, Kevin; Pogge, Richard; Skillman, Evan; Berg, Danielle; Moustakas, John; Walter, Fabian

**Abstract**

The metal content of a galaxy is one of the most important properties used to distinguish between viable evolutionary scenarios and strongly influences many of the physical processes in the ISM. An absolute and robust calibration of extragalactic metallicities is essential in constraining models of chemical enrichment, chemical evolution, and the cycle of baryons in the cosmos. Despite this strong dependence on abundance, the calibration of nebular abundances from nebular emission lines remains uncertain. A large part of the uncertainty in abundances is due to limited information about the electron temperature of an HII region. The sensitivity of MODS on LBT is enabling the detection of numerous temperature sensitive lines and continuum features in nearby galaxies. These lines and features permit a re-evaluation of abundance scale. Furthermore, the efficiency of MODS at multiplexing has permitted us to obtain numerous spectra, enabling detailed studies of abundance gradients both radially and azimuthally.

**Talk ID: Sci**

Submitted by: Felice Cusano

Partner: INAF

Instrument (for science papers): LBC

**Dwarf spheroidal satellites of M31: Variable stars and stellar populations**

Felice Cusano

**Abstract**

In the framework of the hierarchic formation of structures, the dwarf spheroidal satellites we observe today around the Andromeda galaxy (M31) can be the survivors of M31's building process. Their stellar content can thus provide insight to reconstruct the star formation history and the merging episodes that led to the early assembling of M31. In this context we are carrying out a systematic photometric study of several M31 satellites using the Large Binocular Telescope (LBT), the Gran Telescopio Canarias (GTC), and Hubble Space Telescope (HST) archive data.

I will present results from the study of the variable stars and stellar populations in four M31 satellites (Andromeda XIX, Andromeda XXI, Andromeda XXV and Andromeda XXVII) that we observed with the Large Binocular Cameras of the LBT.

**Talk ID: Sci**

Submitted by: Jill Gerke

Partner: OSU

Instrument (for science papers): LBC

**Searching For Failed Supernovae**

Jill Gerke, Christopher Kochanek and Krzysztof Stanek

**Abstract**

As the "Survey About Nothing" we have been monitoring 25 galaxies within 10 Mpc with the Large Binocular Telescope for the past 5 years using the LBCs. With this survey we are able to take a statistical approach the deaths of massive stars and possibly observe the rare phenomenon of a failed supernova, a massive star that collapses to form a black hole without a SN explosion. Analyzing the data using image subtraction, we monitor the fate of all  $\sim 10^6$  evolved supergiants in these galaxies to obtain limits on the rate of failed supernovae.

Additional science goals of the survey include variability studies of SN progenitors and LBVs and studies of Cepheid variables. I will explain the current state of the survey and the results, some preliminary, that it has produced.