# POSTER ABSTRACTS

**Lilia Bassino**

**GMOS photometry of the globular cluster system in the peculiar galaxy NGC 4753**

NGC 4753 is an early-type galaxy with prominent and twisted dust lanes, at a distance of ~17Mpc. It is the brightest galaxy of one of the MK-groups (Makarov & Karachentsev) that populate the Virgo Southern Extension.

Originally classified as a peculiar lenticular galaxy, it is now assigned an irregular de Vaucouleurs type I0. This latter classification points to a merger or a galaxy distorted by gravitational interaction with a close neighbour. The apparently high SNe Ia rate exhibited by this galaxy (NGC 4753 hosted SN 1965I and SN 1983G) may be an indication of an intermediate-age population, an stellar population that may have formed in a merger a few Gyrs ago.

With the aim of disentangling the evolutionary story of this galaxy, we perform a deep g',r',i' photometric study of its globular cluster (GC) system. The GC colour distribution and the specific frequency are the keys to search for evidence of the existence of an intermediate-age population.

**Franz Bauer**

**An X-ray Transient Goes Bump in the Night**

A fast X-ray transient was discovered by Chandra in the Chandra Deep Field-South field on 2014 October 01. The transient lasted only a few ks in duration, reaching a 0.5-8 keV luminosity of at least ~1e45 erg/s (assuming z_phot > 0.3 from nearest galaxy). Surprisingly, no optical or radio transient was found between ~0.05 to 90 days after discovery to deep limits, thereby ruling out many types of phenomenon. I will discuss what possibilities remain and what may imply for future transient surveys.

**Carrie Brum**

**The ionized gas kinematics and distribution in the inner region of the Seyfert galaxies NGC\,4101 and NGC\,3982 observed with GMOS IFU**

We present two-dimensional (2D) maps for emission-line fluxes and ratios and kinematics for the central regions of the Seyfert galaxies NGC4501 and NGC3982, from optical spectra obtained with the GMOS (Gemini Multi Object Spectrograph)

Integral Field Unit (IFU) at the Gemini North telescope at a spatial resolution of ~50 pc for NGC4501 and ~30pc for NGC3982. This maps were constructed from by fitting the emission-line profiles of H_alpha, [N ii] \lambda\lambda 6548,6583.46,[S ii] lambda\lambda 6716.44,6730.81, e [O i] \lambda 6300.30 by Gaussian curves.

For NGC4501, we have also obtained measurements for the stellar kinematics by fitting the Na i absorption by stellar templates, using the pPXF method. Such measurements were not possible for NGC3982, due to the non-detection of absorption lines with signal-to-noise ration high enough.

NGC4501 presents extended-line emission to up to 5'' from the nucleus with flux peak seen at the nucleus. NGC3982 also presents the emission peak at the nucleus for all lines, however it presents emission over the field of view (7 x 15''). A ring of Hii regions is observed in the H_alpha emission with a radius of 5'' from the nucleus for this galaxy.

The gas velocity fields for both galaxies present rotation pattern, being well represented by a kinematic model of rotating disk with circular orbits in the plane of the galaxy. The highest residuals (observed velocities - model) present correlations with dust structures, which can be interpreted as inflows towards the nucleus. The stellar velocity dispersion of the bulge of NGC4501 is sigma_{\star}=150 +/- 30 km/s, resulting in a black hole mass of M_{BH}=3_{-2}^{+5} x 10^{7} M_{\odot} based on the M - sigma relationship. The velocity dispersion map for NGC4501 show values ranging from 50 to 150\,km/s for the forbidden lines, while the H_alpha maps shows overall smaller values, with sigma < 100 km/s at all locations.
The highest sigma values for all emission lines are observed at 2-3'' northeast from the nucleus for NGC4501, being co-spatial with a distortion seen in the velocity field. In NGC3982 observed sigma values ranging 50 to 150 km/s, with the highest values observed at 1'' east from the nucleus.
The electron density maps obtained from the [S ii] lambda 6716 \ lambda 6730 line ratio shows values between 100 cm^{-3} the nucleus to 900 cm^{-3} in a ring with radius 1'' for NGC4501 and values reaching 100 cm^{-3} to 3000 cm^{-3} for NGC3982.

**Hekatelyne Carpes**

**IFU Spectroscopy os IRASF23199+0123**

Ultra Luminous Infrared Galaxies (ULIRG's) are the most luminous objects in the universe and almost all the luminosity is emitted in infrared wavelenght ($L \approx 10^{12} L_\odot$). These objects present disturbed morphology, suggesting that they are gas rich and undergoing collision or merger process. ULIRGs seems to represent a key stage on the evolutive process of galaxies in which tidal torques associated with mergers drive gas into the galaxy core leading to starbursts or fueling an embedded AGN. We are working with IFU-GMOS data of IRASF23199+0123, which is an interacting pair of (ULIRG's) galaxies with both cores classified as Seyfert 2. Preliminary results reveal that this object presents extend emission along the $H_\alpha$ and $[N II]$$\lambda\lambda6548,6583$ lines with the emission peak occurring in the center of the galaxy. In our project the IFU spectroscopy with GMOS instrument has been used in order to map the distribution and the kinematics of the ionized gas and to analyze possible inflows and outflows associated to the AGN activity or starburst.

**André-Nicolas Chené**

**GRACES: High-resolution optical spectroscopy finally possible at Gemini North!**

Gemini Remote Access to CFHT ESPaDOnS Spectrograph (GRACES) is the result of a cooperation between the Canada-France-Hawaii Telescope (CFHT), Gemini, and NRC-Herzberg (Canada). It combines the large collecting area of the Gemini North telescope with the high resolving power and high efficiency of the ESPaDOnS spectrograph at CFHT, to deliver high resolution spectroscopy across the optical region. This is achieved through a 270 m fiber optics feed from the Gemini North telescope to ESPaDOnS.
GRACES performs a maximum resolution power of R ~ 67,500 between 400 and 1,000 nm, with throughput redward of 600 nm comparing those of currently available high-resolution spectrographs in 8-10 m class telescopes. It is planned to be installed and made available to the Gemini community for the 2015B semester.
We present here the basic design, the operation model and on-sky performances.

**Stéphanie Côté**

**Transition Dwarf Galaxies in Nearby Galaxy Groups**

We present GMOS Halpha narrow-band imaging of nearby dwarf galaxies aimed at finding transition dwarf galaxies. Transition dwarf galaxies are dwarfs that show morphological characteristics of both dwarf ellipticals (dEs) and dwarf irregulars (dIs), they can contain some cold gas but do not show current star formation as seen in dIs. They are believed to be the "missing links" between dIs and dEs, ie: they are in

the midst of a transformation between dIs and dEs through some mechanism able to remove the cold gas, drain the anglar momentum and heat the stellar disk. Because most of the dwarf galaxies in nearby groups now have fairly accurate known distances, one can obtain relative distances between the dwarfs and larger galaxies of the group. We find a clear morphology-density relation in the Sculptor, Centaurus A, M81 and Canes Venatici groups, similar to the Local Group, where dEs are at smaller distances to the most massive galaxies while dIs are at larger distances, and interestingly transition dwarfs are found at intermediate distances. We will present preliminary results from our follow-up GMOS longslit observations of four transition dwarfs, to find clues on their transformation process. For the analysis we used the full spectrum fitting package UlYss (Koleva et al 2009). Our preliminary results show that these systems are all clearly dispersion dominated with v/? < 1, like most dwarf elliptical galaxies.

**Dennis Crabtree**

**Gemini's Science Productivity and Impact**

Refereed papers based upon Gemini data represent Gemini's contributions to the field of astronomy. I will present Gemini's productivity (# of papers) and impact (based on citation counts) in comparison to other optical/ir telescopes.

**Eduardo Cypriano**

**The merging cluster Abell 1758: adding new pieces to solve a complex puzzle**

Merging galaxy clusters are excellent laboratories for the study of their three main components: galaxies, intracluster medium (ICM) and dark matter plus the interaction between them. The cluster Abell 1758 (z = 0.278), which has two clear sub-structures (North and South; apparently not in interaction) has been extensively studied by means of several techniques (X-rays, lensing and galaxy dynamics) and all evidence points that the North clump has its own sub-structures (NE & NW) which are in a post-collisional configuration. However this is a complex system and not all the phenomenology has been well understood. We revisited this cluster using deep three band Subaru images for weak lensing analysis and a multi-object spectroscopy from GMOS/N for the dynamical analysis. Here we present mass reconstruction and a proposed scenario post merger.

**Alexandre David-Uraz**

**X-ray emitting B stars in the Carina Nebula: magnetism or active low-mass binary companions?**

The Chandra Carina Complex Project (CCCP) has detected an important number of X-ray emitting late-B stars in the Trumpler 14 and Trumpler 16 clusters. This result was surprising given the low incidence of magnetic fields in such stars. Multi-object spectroscopy was obtained on GMOS for over 60 of these objects. The goal of this study is to determine whether the X rays are due to intrinsic processes, or whether they origin from young, active low-mass binary companions. By acquiring multiple epochs for each of these 60+ stars, we search for radial velocity shifts indicative of such companions, and flag potential candidates for follow-up observations.

**James De Buizer**

**Gemini and SOFIA Observations of Massive Star Formation**

We have demonstrated theoretically and observationally that mid-infrared observations are crucial for defining the spectral energy distribution of massive protostars and thus their bolometric flux directed towards us. Through observations with Gemini's mid-infrared imagers that it was demonstrated that mid-infrared emission from massive protostellar objects are dominated by re-radiation via outflow cavities. However, SOFIA imaging data at wavelengths longer than what can be observed from ground-based facilities have been showing that the 40 micron brightness peak is typically very close to the actual massive protostar's position. Gemini and SOFIA data combined with sophisticated radiative transfer modeling,

analysis of the full range of 10-40micron emission constrains the geometry of the outflow cavities, allowing more reliable measurement of the true bolometric luminosity and thus mass of massive protostars.

**Antonio de Ugarte Postigo**

**OCTOCAM (GIFS) instrument**

This poster will present the general concept and capabilities of the OCTOCAM instrument that is being proposed as part of the Gemini Instrument Feasibility Studies (GIFS). OCTOCAM is an efficient multi-channel imager and spectrograph, which can simultaneously obtain imaging in 8 different bands (g, r, i, z, Y, J, H and Ks) or intermediate resolution (R~3000-4000) spectroscopy in the range from 3600 A to 24000 Å. Its detectors are being selected to allow for high-time resolution modes, without compromising standard modes. Additional subsystems are being studied to allow integral field spectroscopy, spectropolarimetry and higher resolution (R~10,000) spectroscopy. The unique capabilities of this workhorse instrument will open a plethora of science cases

**Ruben Diaz**

**Uncovering the nucleus candidate for NGC 253**

NGC 253 is the nearest spiral galaxy with a nuclear starburst, which becomes the best candidate to study the relationship between starburst and AGN activity. However, this central region is veiled by large amounts of dust, and it has been so far unclear which is the true dynamical nucleus to the point that there is no strong evidence that the galaxy harbors a supermassive black hole co-evolving with the starburst as was supposed earlier. The near infrared spectroscopy, especially the near infrared emission line analysis, could be advantageous in order to shed light on the true nucleus identity. Using Flamingos-2 at Gemini South we have taken deep K-band spectra along the major axis of the central structure and through the brightest infrared source. In this work, we present evidence showing that the brightest near infrared and mid infrared source in the central region, already known as radio source TH7 and so far considered just a large stellar supercluster, in fact, presents various symptoms of a genuine galactic nucleus. Therefore, it should be considered a valid nucleus candidate. Mentioning some distinctive aspects, it is the most massive compact infrared object in the central region, located at 1.4?? of the symmetry center of the galactic bar, as measured in the K-band emission. Moreover, our data indicate that a large circumnuclear stellar disk surrounds this object and it is also located at the center of rotation of the large molecular gas disk of NGC 253. Furthermore, a kinematic residual appears in the H2 rotation curve, with a sinusoidal shape consistent with an outflow of 15.7 km/s centered in the candidate nucleus position. The maximum outflow velocity is located about 14 pc from TH7, which is consistent with the radius of a shell detected around the nucleus candidate, observed at 18.3 ?m (Qa) and 12.8 ?m (NeII) with T-ReCS. Also, the Br? emission line profile is pronounced blue-shifted and this emission line has also the highest equivalent width (EW) at this position. All these evidences point out TH7 as the best candidate to be the galactic nucleus of NGC 253.

**Marlon Dinz**

**Feeding Versus Feedback in AGN from Near-Infrared IFU Observations: The Case of NGC2110**

We present a two-dimensional mapping of the gas flux distributions, as well as of the gas and stellar kinematics in the inner 220\,pc of the Seyfert galaxy NGC\,2110, using K-band integral field spectroscopy obtained with the Gemini instrument NIFS (Near-infrared Integral Field Spectrograph) at a spatial resolution of $\approx24\,$pc and spectral resolution of $\approx40\,$\kms.

The \H2\,$\lambda\,2.1218\,\mu$m emission extends over the whole field-of-view, while the Br$\gamma$ emission is restricted to a bipolar region extending along the South-East -- North-West direction. The H$ _2$ emission is due to excitation by thermal processes, attributed to heating by X-rays

from the AGN or by shocks at a temperature of $\approx2100-2700$\,K. The masses of the warm molecular gas and ot the ionised gas have been estimated from the total fluxes in the H$_2\,\lambda\,2.1218$ and Br$\gamma$ emission lines and\ are $M_{\rm H_2}\approx1.43\times10^3\,{\rm M_{\odot}}$ and $M_{\rm H\,II}\approx1.77\times10^6\,{\rm M_{\odot}}$, respectively.
The stellar kinematics present velocity dispersions reaching 250\,km\,s$^{-1}$, but also a rotation pattern reaching a similar velocity amplitude. The gas velocity fields present a similar rotation pattern but also additional components that we attribute to inflows and outflows most clearly observed in the molecular gas emission. The inflows are observed beyond the inner 70\,pc, and are associated to a spiral arm seen in blueshift to the North-East (far side of the galaxy plane) and another in redshift to the South-West (near side). We have estimated a mass inflow rate in warm molecular gas of $\approx{\rm 4.1\times10^{-4}\,M_{\odot}\,yr^{-1}}$.
Within the inner 70\,pc, another kinematic component is observed in the \H2 emission that can be interpreted as due to a bipolar nuclear outflow oriented along the east-west direction, with a mass-outflow rate of $\approx{\rm 4.6\times10^{-4}\,M_{\odot}\,yr^{-1}}$ in warm \H2.

**Carlos Escudero**

**The globular cluster system of the galaxy NGC 4546: clues about the origin of S0 galaxies.**

Based in GMOS images, we present the first photometric caracterization of the globular cluster system (GCS) of NGC4546. This lenticular galaxy, located in low density environment, poses a challenge in understanding of their origin and evolution.
We also present radial velocities measurements, metallicities, [alfa/Fe] abundance ratios and ages of a sample of GCs and a ultra-compact dwarf (UCD) associated with the galaxy.
Through measured Lick indices in the obtained spectra, we found that most of the measured GCs have ages higher than 10 Gy, with metallicities ranging from [Z/H]=-2 to 0.45, and alpha-element abundances consistent with a value of [alpha/Fe]~0.2.
The UCD look young and metal rich. In this context, the presence of two GCs young, would indicate that they may have formed in the same merger event that formed the UCD.

**Ori Fox**

**Infrared Follow-up Observations of Supernovae with Gemini in the Era of Giant Glass**

Upcoming transient surveys LSST and WFIRST will populate new regions of phase space (luminosity, color, and duration), and multi-wavelength follow-up observations will be desired to characterize these targets. Despite significant progress in the SN field over the past few years, however, infrared (IR) observations of SNe remain sparse. In the era of 25-m+ telescopes, Gemini will be optimized to devote time to multi-epoch, multi-wavelength follow-up of these new transients. Here I describe the key science topics probed by the next generation of IR observations and how Gemini will play a roll. I will focus attention on OCTOCAM, a VIS/IR imager/spectrograph that is part of the current Gemini Instrument Feasibility Study (GIFS).

**Tom Geballe**

**Feeding and Feedback in AGN: the case of NGC5548**

We are nearing completion of a low resolution K-band survey of ~500 highly reddened stars in the Central Molecular Zone (CMZ) of the Galaxy. The goal is to find objects that are suitable for high-resolution 2-5 micron spectroscopic studies of the CMZ's interstellar gas. Until recently very few such objects have been identified outside of the Central and Quintuplet clusters. We have used Spitzer (GLIMPSE) and 2MASS photometry to identify candidate objects and have been acquiring quick K-band spectra (mostly at Gemini N&S in poor weather) to determine their natures. Although by far the majority of candidates have turned

out to be cool and/or highly reddened red giants, approximately 10 percent of them have featureless or nearly featureless spectra. Most of these have spectra rising steeply to longer wavelengths and are luminous, dust-embedded stars of unknown classification; some are previously unreported emission line objects.

**Denise Gonçalves**

**First prove of shock excited H2 in low-ionization structures of PNe**

We report on the first detection of near-infrared H2 line emission from the low-ionization structures (LIS) in planetary nebulae (PNe). The deep, high-angular resolution H2 v=1-0, 2.122 micron, and H2 v=2-1, 2.248 micron images of K 4-47 and NGC 7662, obtained using NIRI@Gemini-N, are presented here. Similarly to the optical, in the near-IR K 4-47 reveals a remarkable high-collimated irregular main structure as well as a pair of high-speed, low-ionization knots, located at the tips of the nebula. The H2 v=1-0/v=2-1 line ratio varies from 4 to 8, in both structures, indicating a strong shock interaction over the whole nebula. The strongest of these two lines, H2 v=1-0, is also detected in several LIS of the elliptical PN NGC 7662, but for this PN the fainter H2 (v=2-1) emission is much lower than in the K 4-47 case. The latter suggests high H2 v=1-0/v=2-1 ratio --therefore possible shock excitation. Moreover, none of the H2 emission lines is detected associated with the main nebular shells of NGC 7662. Our preliminary results provide the first direct evidence that LIS are also made of H2 molecular gas (as previously suggested) and prove that shocks are the main excitation mechanism of the molecular H of the PNe low-ionization structures.

**Thomas Hayward**

**Monitoring and Improving Image Quality of the Gemini Telescopes**

We describe an ongoing program to monitor and improve the Image Quality of both Gemini Telescopes. Two principal sources of IQ degradation have been identified: miscollimation and vibrations. We present data illustrating the effects of both issues, and discuss efforts to mitigate them and improve the IQ.

**Moiré Hennig**

**Title: A nuclear molecular ring in Mrk1066 revealed by PCA tomography**

In this work, we apply the PCA Tomography technique (Principal Component Analysis) to data cubes for the central region of the Seyfert 2 galaxy Mrk1066. The observations were done with the NIFS (Near-infrared Integral Field Spectrograph) instrument at Gemini North Telescope in the spectral bands J and K and with spatial resolution of ~ 35 pc. Mrk1066 has been the subject of studies by our working group, with the application of traditional techniques (as fitting of the emission-line profiles and measurements of stellar kinematics). Thus the use of the PCA Tomography in this work, which is a powerful statistical tool, is aimed to confirm previous results obtained with the use of traditional techniques, and at the same time searching for details of the physics of the central region of this galaxy, not seen in traditional analysis.

The PCA Tomography was applied to datacubes for J and K bands at distinct spectral and spatial regions in order to emphasize regions of interest. With the simultaneous analysis of the eigenvectors and tomograms, we highlight some results for the central region of Mrk 1066: 1) We detected a ring of molecular gas (H2) with a radius of ~ 75 pc, not detected in previous works, which seems to be being fed by gas flows along the spiral arms that originate in the ring; 2) we detected dust emission in an unresolved central structure, which was interpreted as being related to the presence of the dusty torus postulated by the unified model for AGNs (Active Galactic Nuclei); 3) emission of gas in a rotating disk in the plane of the galaxy was also detected, in agreement with previous studies; 4) we found outflows of ionized gas from the nucleus of Mrk1066 associated with the radio jet, beyond phenomena with complex kinematics, not interpreted in this work.

We constructed flux maps for the continuum emission and for the main emission lines present in the spectra of Mrk1066 from reconstructed datacubes using only some eigenvectors in order to highlight physical phenomena. We observed a good
correlation between the fluxes of emission lines of the ionized gas and radio emission in some tomograms and investigated the origin of the [Fe ii] line emission using line ratios. We found the following values [Fe ii] ?1,2570?m/Pa? = 0,9 and [Fe ii]?1,2570?m/[P ii] ?1,1886?m = 4,2. These values indicate that there may be a contribution by shocks due to radio jet to the [Fe ii] excitation. The shocks release the Fe from grains of dust enhancing the Fe abundance and thus the fluxes of the emission lines of the [Fe ii] is increased.

**Ken Hinkle**

**Abundances on the 47 Tuc Giant Branch and AGB**

Abundances on the 47 Tuc Giant Branch and AGB Abstract Text: The rich cluster 47 Tuc presents a well-defined sample of giant branch and AGB stars. A sample of 5 non-variable red giants and 7 variable AGB stars were observed at 1.555 and 2.341 microns with Phoenix at Gemini South. The spectra include molecular lines from 12CO, 13CO, OH, CN, and HF as well as a number of atomic lines. Stars in 47 Tuc have well-characterized mass, metallicity, and luminosity. C/O and 12C/13C abundances were derived for giant branch stars using standard hydrodynamic and LTE techniques. The variable star sample includes large amplitude Mira variables. We computed abundances for the AGB stars using dynamical model atmospheres and then compared the results against those for the red giants. Assuming that the abundance pattern stays constant from the upper giant branch to the AGB in these low-mass stars, we used the results to gauge our ability to model dynamical stellar atmospheres.

**Paul Hirst**

**The New Gemini Data Archive**

Gemini will be moving to a new data archive system at end of 2015. The new archive has been designed to be simple and easy to use, especially for the most common use cases: 1) A Gemini user retrieving data from their observing program along with the necessary calibrations, and 2) Searches for observations of given objects in given instrument configurations. I will present an overview and demonstration of the new archive system, and highlight some notable new features.

**Steven Janssens**

**Red Nuggets in the Adaptive Optics Deep Field**

We have used GeMS/GSAOI to obtain high resolution imaging of a small sample of massive, compact, quiescent galaxies (red nuggets) at z ~ 2. These observations were done in the Adaptive Optics Deep Field (AODF), a 1 square degree field that is excellent for observations using adaptive optics (AO) due to its low extinction yet high stellar density. Existing extragalactic deep fields are non-ideal for AO observations since they are located far from the Galactic plane to minimize extinction. However, this also minimizes the availability of guide stars. The biggest challenge has been dealing with the field distortion introduced by GeMS. I will show our attempts to deal with this and some early results. In addition, I will share results from a collaboration with 2dFLenS where we are obtaining spectra for ~500 red nuggets at $0.2 < z < 1$ to better understand the population at intermediate redshifts.

**Minjin Kim**

**Optical Spectroscopy of X-ray selected Intermediate-mass Black Holes**

We present high-resolution optical spectra of newly selected candidates of intermediate-mass black holes. The sample was selected based on the variability and spectral shape in X-ray. The spectra was taken with Magellan 6.5 m Clay Telescope and cover the rest-frame region 3500-10000A. Interestingly, the majority of the sample appears to have broad emission lines. The high spectral resolution (R~4000) of the

spectrum allows us to estimate black hole mass and Eddington ratio, which helps to understand the physical properties of the intermediate massive black holes.

**Sam Kim**

**[CII] Emission Detection on LABOCA Resolved Triple Components at z=4.441**

Galaxy-formation theories tell that massive galaxies at high redshifts should act as signposts to high-density environments in the early universe. These regions are characterized by over- densities of young galaxies, including a population of dusty, interaction-driven starbursts - the progenitors of massive cluster ellipticals. By searching for this population at submillimeter (submm) wavelengths we can therefore test both galaxy and structure-formation models. We performed deep submm follow-up observation near one of the brightest source in Herschel surveys. Our APEX/LABOCA map revealed an over-density of luminous submm galaxies (triple components within 30") compared to typical fields. Also we confirm the redshift redshift of each component from [CII] (z=4.447) and CO(5-4) (z=4.441) observation. [CII] line emission on the brightest component among them has L[CII] = 2.29 x 10^10 L_sol and the line to total FIR luminosity ratio is L[CII]/LFIR = 9.2×10^?4 which will be consistent high redshift source [CII] deficit relation. Follow-up deep optical and high resolution sub-mm observation is required to constraint the position and redshift of this unique high redshift photo cluster and eventually to understand the progenitors and environment of massive clusterellipticals when the Universe was younger than 2 Gyr old.

**Sang Chul Kim**

**KMTNet Supernova Project : The Introduction**

The three wide-field (2 deg x 2 deg) 1.6m diameter KMTNet telescopes in the southern hemisphere are almost being installed: the first two telescopes in Chile and South Africa are installed and the final one will be installed in June. Currently, we are at the initial performance-verification phase of our KMTNet Supernova Project (KSP) using the first two telescopes. The primary science objectives of KSP, which take advantage of its unique 24-hour continuous sky coverage, are to study early (i.e., within a few hours from explosion) and rare/peculiar (e.g. fast decay) supernovae (SNe), SN progenitors, explosion mechanisms, as well as other exotic optical transients. Using the fast-enough readiness of Gemini-South Target-of-Opportunity observational ability, we proposed to obtain follow-up spectroscopy of candidate SNe found by KSP. We present the initial status of the program, along with the program strategy, science objectives, target fields, and future plan.

**Angela Cristina Krabbe**

**A study of the star formation history of a sample of galaxy pairs.**

We present an observational study of the interaction effects of the stellar population in a sample of galaxy pairs. This study is based on long-slit spectrophotometric data in the range of 3500-7300 Å, obtained with the Gemini Multi-Object Spectrograph at Gemini South (GMOS-S). We used the stellar population synthesis code STARLIGHT to investigate the star formation history of these objects. The fitting was performed based on 45 SSP templates of simple stellar population (SSP) of Bruzual & Charlot(2003), which included 15 different ages from 1 Myr to 13 Gyr (i.e. 1, 3, 5, 10, 25, 40, 100, 3000, 600, 900 Myr & 1.4, 2.5, 5, 11, and 13 Gyr) at each of the three metallicities: 0.2, 1, and 2.5 Zsolar. We have defined a condensed population vector by binning the stellar populations according to the flux contributions into young, xy < t ? 5x107 yr); intermediate xi (5x107 < t ? 2x109 yr); and old (5x107 < t ? 2x109 yr) components. The results presented in this poster include: a) spatial profile of stellar-population components for each system; b) a comparison of these results with those obtained with isolated galaxies; c) comparison of the stellar age versus the gas metallicities and stellar metallicities; and d) comparison between the AV[synthesis] extinction values measured from the stellar populations synthesis with AV [C(H)] gas extinction coeficient obtained from emission lines.

**Kathleen Labrie**

**Signatures of Quasar Microlensing GSAOI**

In a multi-imaged quasar, differential microlensing is characterized by a variation in the magnification levels of different spectral components in a single lens image, compared to the unmicrolensed quasar spectrum. In the absence of microlensing, we expect emission line and continuum flux ratios to be equivalent to each other and to agree with the macro-model flux ratios, and we also expect flat, featureless spectral ratios. In the presence of microlensing, the emission lines from the broad emission line region and/or the continuum will cause features on the spectral ratios. The flux ratios and the shape of the features in the spectral ratios can be used to put constraints on the size and the kinematics of the sources of emission. We observed several multi-imaged quasars with GMOS IFU and present here an interpretation of the spectra for three of those.

**Olivier Lai**

**Altair and the future of Gemini North Adaptive Optics**

Altair is the facility single conjugate adaptive optics system at Gemini North. It has been in operations for 12 years (and upgraded to LGS in 2007). Unfortunately its performance is hindered by various effects and some of its components are aging. Therefore an upgrade plan has been initiated, but these upgrades have to be weighed against the opportunity for a new generation AO system as the Gen4#4 instrument. In this presentation, I will describe some of the limitations that apply to Altair (and will therefore most likely also apply to any subsequent AO system) and the current status of the upgrade plan. I will also give an overview of the adaptive optics landscape at the 2020 horizon and focusing on Gemini strengths, identify the areas where a new generation system could have a substantial impact. In fact, working in synergy with the other Mauna Kea observatories and with careful planning, it may be possible (and certainly advisable) to develop a common strategy so as to reduce duplication of effort and offer the full range of AO capabilities, from narrow field with high strehl to very large fields and improved seeing, to the entire Mauna Kea community through telescope time exchange programs.

**Jae-Joon Lee**

**UKIRT Widefield Infrared Survey for Fe+**

The United Kingdom Infrared Telescope (UKIRT) Widefield Infrared Survey for Fe+ (UWIFE) is a 180 deg^2 imaging survey of the first Galactic quadrant (7d < l < 62d; |b| < 1.5d) using a narrow-band filter centered on the [Fe II] 1.644 um emission line. The [Fe II] 1.644 um emission is a good tracer of dense, shock-excited gas, and the survey will probe violent environments around stars: star-forming regions, evolved stars, and supernova remnants, among others. The UWIFE survey is designed to complement the existing UKIRT Widefield Infrared Survey for H2 (UWISH2; Froebrich et al. 2011). The survey will also complement existing broad-band surveys. We present the overview and preliminary results of this survey and our follow-up effort with Gemini telescopes.

**Marie Lemoine-Busserolle**

**NIFS Python data reduction pipeline and NIFS Observations of Turbulent Disks at z~1**

I will present a new data reduction python pipeline that uses the GEMINI IRAF package to reduce NIFS data. I will also present preliminary result on 2D kinematics of a Z~1 galaxy obtained with NIFS with laser adaptive optics for a pilot study of Halpha velocity and dispersion fields of kinematically-selected galaxies. Previous studies at these redshifts probed only the bright inner regions (<1-2 scale-lengths). NIFS' superior low-surface brightness sensitivity will reveal kinematics in the outer 3-4 scale-lengths, allowing us to investigate whether the irregular kinematics detected in our slit spectra are driven by phenomena such as major or minor-merger activity and/or violent star-formation.

**Lison Malo**

### Using OPERA to reduce GRACES data

The Gemini Remote Access to CFHT ESPaDOnS Spectrograph (GRACES) has achieved first light of its experimental phase in May 2014. It successfully collected light from the Gemini North telescope and sent it through two 270m optical fibers to the ESPaDOnS spectrograph at Canada-France-Hawaii Telescope (CFHT) to deliver high-resolution spectroscopy from 400nm to 1000nm. Data obtained with ESPaDOnS require sophisticated echelle spectro-polarimetric image reduction pipeline. CFHT has developed the Open source Pipeline for ESPaDOnS Reduction and Analysis (OPERA), to reduce data obtain with ESPaDOnS. OPERA is designed to be fully automated, performing calibrations and reduction, producing one-dimensional intensity and polarimetric spectra. The calibrations are performed on two-dimensional images and reduced products are wavelength calibrated. Recently, OPERA has been adapted to reduce GRACES data. This talk will briefly review the GRACES project before focusing on how we plan to use the OPERA reduction pipeline to obtain extracted spectra for GRACES data.

**Murilo Marinello**

### Unraveling the excitation mechanisms of AGN super-strong FeII emitters

We present, for the first time, NIR observations of 6 super-strong FeII AGN emitters obtained with GEMINI/GNIRS, aimed at studying the FeII in the range 0.8-2.5 microns. To this purpose we use a semi-empirical template obtained from IZw1 that reproduces well the FeII in AGNs with moderate FeII emission. We analyze the width and intensity of the FeII lines in order to derive the most probable location of its emitting region and to study the formation mechanisms of that ion, respectively. A comparison of the individual width of FeII lines with that of other BLR lines show that the FWHM of iron systematically approaches to that of OI and CaII and is considerably smaller than that of Hydrogen. This confirms previous assumptions that the gas responsible for the FeII emission is located in outer portion of the BLR. We correlate the strength of the NIR and optical iron lines to derive the relative contribution of the different excitation mechanisms that produces that emission. We found that in all cases the Lymann-Alpha fluorescence plays an important role and is a process that cannot be ignored by theoretical models. Our results also point out that collisional excitation dominates the strength of the observed FeII spectrum.

**Rachel Mason**

### Gemini's Fast Turnaround Program

The Fast Turnaround program, launched at Gemini North in January 2015, allows users to submit observing proposals every month. This poster will outline how the scheme works and also show some of the data we have collected to measure how well the pilot program is going. We would very much like to hear your thoughts about how the FT program could be optimized; please stop by and give us your thoughts!

**Bryan Miller**

### Testing MOND in NGC3923

We report on a test of MOND using the shell system of the elliptical galaxy NGC3923. NGC3923 has 27 known stellar shells due to the disruption of a galaxy that merged with it. Bilek et al. (2014) used MOND to reproduce locations of the existing shells and predicted an additional, lower surface brightness outer shell at a projected radius of 210 kpc (31.7 arcmin). This is a clean and important test of MOND. We have imaged a field at the edge of the predicted shell as well as a control field at the location of the known Shell 1N/a using GMOS-S at Gemini South. The known Shell 1N/a is clearly detected. No obvious structures are detected at the location of the predicted shell down to a surface brightness of r ~ 28 mag/sq. arc sec. Ongoing work will quantify the detection limits and look for structures at lower surface brightnesses. Implications will be discussed.

**Sung-Joon Park**

### The Korean Space Programs for Infrared Astronomy

Korea Astronomy and Space Science Institute (KASI) is developing the Near-infrared Imaging Spectrometer for Star formation history (NISS), which is a payload of the Korean next small satellite 1 (NEXTSat-1) and will be launched in 2017. Major scientific goal of NISS is to probe the star formation in local and early Universe, such as nearby galaxies, galaxy clusters, star-forming regions, and low background regions, with an imaging spectroscopic observation in near-infrared. The off-axis catadioptric optics with 150mm aperture diameter will cover the passband of 0.95-3.8?m and 2x2 deg FOV. The linear variable filter (LVF) will be used as a disperse component with spectral resolution of R~20 (FWHM is ~20%). The opto-mechanical structure was designed to be safe enough to endure the launching condition and the space environment and whole instrument will be cooled down to 200K by radiation cooling method in orbit. The NISS will explore the large near-infrared sky up to 200 deg2. In addition, we report the current status of Korean space programs for astronomy for the future.

**Fredrik Rantakyro**

### Present and Future of the Gemini Planet Imager

We present a summary of the current status of the Gemini Planet Imager and detail the near future improvements to the instrument. Focus is evenly split between operational aspects and instrument hardware and software improvements.

**Irapuan Rodrigues**

### Oxygen abundance gradients in interacting galaxy pairs

Gemini/GMOS-South long-slit spectra in the range 4400-7300 Å were used to derive oxygen abundance gradients from H II regions located in 11 galaxies in eight systems of close pairs. Spatial profiles of oxygen abundance in the gas along galaxy discs were obtained using calibrations based on strong emission lines (N2 and O3N2). We found oxygen profiles for all the galaxies in our sample to be significantly flatter than those in typical isolated spiral galaxies. Four objects in our sample, AM 1219A, AM 1256B, AM 2030A and AM 2030B, show a clear break in the oxygen abundance at galactocentric radius R/R25 between 0.2 and 0.5. For AM 1219A and AM 1256B, we found negative slopes for the inner gradients, while for AM 2030B, we found a positive slope. All three cases show a flatter behaviour to the outskirts of the galaxies. For AM 2030A, we found a positive slope for the outer gradient, while the inner gradient is almost compatible with a flat behaviour. We found a decrease of star formation efficiency in the zone that corresponds to the oxygen abundance gradient break for AM 1219A and AM 2030B. For the former, a minimum in the estimated metallicities was found very close to the break zone, which could be associated with a corotation radius. However, AM 1256B and AM 2030A, present a star formation rate maximum but not an extreme oxygen abundance value. All four interacting systems that show oxygen gradient breaks have extreme SFR values located very close to break zones.The H II regions located in close pairs of galaxies follow the same relation between the ionization parameter and the oxygen abundance as those regions in isolated galaxies.

**Katherine Roth**

### GMOS CCDs Upgrade: One Down, One to Go!

Gemini Observatory is in the middle of a major detector upgrade for the twin GMOS optical imager and spectrograph instruments. These are the workhorses of the Gemini Observatory, accounting for ~ 40-50% of the executed observations at each site. While GMOS North and South have proven to be reliable and demand has remained high, the aging CCD detectors had impacted their competitiveness compared to other moderate resolution optical spectrographs on 6-10 m class telescopes. This is particularly true at longer wavelengths where recent advances in CCD technology have yielded fully depleted CCDs which

extend the wavelength quantum efficiency (QE) useful range beyond 1 micron. The GMOS-N detectors were upgraded with an interim set of deep-depletion CCDs in October 2011, yet the GMOS-S original blue-optimized CCDs remained. These CCDs had a red wavelength QE that declined steadily from only 70% at 750nm, to fall below 20% at 925nm.
Fully depleted red-sensitive CCDs manufactured by Hamamatsu Photonics were installed in GMOS-S in June 2014. These detectors provide significantly improved QE over the original GMOS-S EEV detectors at all wavelengths longer than ~ 680nm, particularly in the far red. For example, the Hamamatsu QE does not fall below 20% until 1.03 microns, and at 925nm the QE exceeds that of the original GMOS-S CCDs by more than a factor of four. In the blue, however, these CCDs are not as sensitive as the original EEV devices, delivering lower QE shortward of ~ 500nm. We present commissioning results and discuss the impact of these new detectors on various science cases. We also present plans to replace the GMOS-N deep depletion e2v detectors with Hamamatsu CCDs in the very near future.

**Stuart Ryder**

**The First Supernova Discovered with GeMS/GSAOI**

Luminous Infra-Red Galaxies (LIRGs, with between 10^11 and 10^12 solar luminosities in the far-infrared) are believed to be forming stars at a rate that should yield on average one core-collapse supernova event per year, and yet hardly any have been found. Our search for core-collapse supernovae in LIRGs with adaptive optics on Gemini North has enabled us to place the first empirical constraints on the fraction of supernovae missed by optical surveys. We have commenced a search with the powerful new GeMS/GSAOI facility on Gemini South, and our first epoch images of the LIRG IRAS 18293-3413 already reveal a new supernova not seen in any optical survey.

**Dinalva A. Sales**

**Discovery of two nuclei in the process of merging in the OH Megamaser Galaxy IRAS17526+3253**

OH Megamaser galaxies (OHMG) comprise roughly 20% of luminous and ultraluminous infrared galaxies (ULIRGs) radiating bright OH masers lines at 1667 and 1665 MHz. (U)LIRGs that host OHMs are predominantly merging systems with a preference for the most far-infrared luminous, suggesting that the presence of OHM require exceptionally high concentrations of dense molecular gas, perhaps associated with a temporal spike in tidally driven gas inflow. We present a two-dimensional analysis of the gaseous excitation and kinematics of the OHMG IRAS17526+3253 obtained with the Gemini Multi-Object Spectrograph Integral Field Unit (GMOS-IFU) on the Gemini North telescope. This merger system is classified as a double Starburst nucleus and is also in an advanced merger stage separated by ?8 kpc, which are each associated with compact (but resolved) radio sources. We centered the GMOS-IFU field-of-view at the brightest 1.49GHz radio emission, corresponding to the southern nucleus. The GMOS-IFU data reveals that this nucleus is actually double, with two sources, appearing both in the continuum and in gas emission, and separated by ~835 pc. These two nuclei have associated extended gas emission distributed over the whole field-of-view (~1.7 x 2.5 kpc), with one system observed in blueshift (coming towards us) and the other in redshift (moving away from us). Our observations thus show that this OH Megamaser system is actually the result of the merger of three galaxies.

**Jaderson Schimoia**

**Short-Timescale monitoring of the X-ray, UV and broad double-peak emission line of the nucleus of NGC1097**

Recent studies have suggested that the short-timescale (~7 days) variability of the broad (~10,000 km/s) double-peaked Halpha profile of the LINER nucleus of NGC1097 could be driven by a variable X-ray emission from a central radiatively inefficient accretion flow (RIAF). To test this scenario, we have monitored the NGC1097 nucleus in X-ray and UV continuum with Swift and the Halpha flux and profile in

the optical spectrum using SOAR and Gemini-South from 2012 August to 2013 February. During the monitoring campaign, the Halpha flux remained at a very low level --- 3 times lower than the maximum flux observed in previous campaigns and showing only limited (~20%) variability. The X-ray variations were small, only ~13% throughout the campaign, while the UV did not show significant variations. We concluded that the timescale of the Halpha profile variation is close to the sampling interval of the optical observations, which results in only marginal correlation between the X-ray and Halpha fluxes. We have caught the AGN in NGC1097 in a very low activity state, in which the ionizing source was very weak and capable of ionizing just the innermost part of the gas in the disk. Nonetheless, the data presented here still support the picture in which the gas that emits the broad double-peaked Balmer lines is illuminated/ionized by a source of high-energy photons which is located interior to the inner radius of the line-emitting part of the disk.

**Astor Joao Schonell Jr.**

**Feeding and Feedback in AGN: the case of NGC5548**

The study of the extended gas emission in the Narrow-Line Region (NLR) around nearby Active Galactic Nuclei (AGN) allows the investigation of both the AGN feeding – via gas inflows, and feedback – via the interaction of the AGN radiation and mass outflow with the circumnuclear gas, affecting its kinematics and excitation. With that in mind we obtained integral field spectral observations in the near-IR with the NIFS instrument of Gemini-North telescope in the J and K bands of the inner 1.15 kpc x 1.15 kpc of the Seyfert 1 galaxy NGC5548, at a spatial resolution of ~40 pc.

The nuclear spectrum shows a very bright and broad (~9000 km/s) component in the Pashen Beta (PaB) emission line. Outside the nucleus, a narrow component is observed up to 300 pc from the nucleus. Its kinematics reveal two components, one coming from gas rotating in the galaxy disk and the other blue shifted to -250 km/s relative to the systemic velocity of the galaxy, interpreted as due to an outflow directed toward us. The [FeII]1.64microns emitting gas also presents similar two components following the behavior observed for PaB.Using the STARLIGHT's code adapted to the near-IR, we performed spectral synthesis of the stellar population, revealing that, at the nucleus, the main components are: a Black Body (T=1350K) component, attributed to a dusty torus and a high contribution (~80% in luminosity) from young stars (age < 50x10^6yr), observed within ~100pc from the nucleus and extending additional 100 pc to the east. Old stars (age >2x10^9yr) dominate in the remainder of the observed field-of-view.

**Letizia Stanghellini**

**Gas-phase oxygen abundances and radial metallicity gradients in nearby spiral galaxies**

We present a gas-phase abundance study in H II regions of two spiral galaxies, NGC 7793 and NGC 4945, which are considered "twins" respectively of M33 and the Milky Way, based on their masses and morphologies. We measured strong-line oxygen abundances of H II regions by GMOS-S multi-object spectroscopy. We found that the sub-solar galaxy NGC 7793 has a well-defined gas-phase radial oxygen gradient of -0.075 (+-0.049) dex/kpc, not dissimilar from gradients calculated with weak-line abundance methods in galaxies of similar mass, metallicity, and morphology. On the other hand, NGC 4945 has an uncertain radial oxygen gradient, its uncertainty due to its large projection angle. Since, at zeroth order, we expect the radial metallicity gradients to depend on mass and galaxy type, we compared our galaxies in the framework of radial metallicity models best suited for M33 and the Galaxy respectively. We found a good agreement between M33 and NGC 7793, thus disclosing a similar evolution for the two galaxies. We noticed instead differences between NGC 4945 and the radial metallicity gradient model that best fits the Milky Way. We used our modified chemical evolution models to find that these differences are likely related to the presence of an AGN and a bar in the NGC 4945's central regions.

**Joanna Thomas-Osip**

**Photometric Calibration with the Gemini South Adaptive Optics Imager (GSAOI)**

The photometric calibration of the Gemini South Adaptive Optics Imager (GSAOI) is established using observations of photometric standard stars obtained over a more than two year period. We present zero-points, color terms, and sky background for the GSAOI broad-band filter set, Z, J, H, Kprime, Kshort, and K. An instrument monitoring program will continue to monitor the zero-points as photometric standard observations are collected each GSAOI/GeMS run.

**Joanna Thomas-Osip**

**Introducing the Science User Support Department**

The Science User Support Department was formed to consolidate post-observing support and enable Gemini Principal Investigators to produce world-class scientific results in a timely manner. The SUSD supports data archiving and reduction including the Data Reduction User Forum, interacts with the National Gemini Offices (NGOs), and shepherds helpdesk activities. The intent is to develop a new paradigm for Gemini user support via the creation of a collaborative community of users, NGOs and Gemini staff.

**Christina Thöne**

**A simultaneous optical/nIR IFU for the GIFS OCTOCAM project**

OCTOCAM is a simultaneous optical-nIR camera and spectrograph selected for the Gemini feasibility study for a new workhorse instrument. One of the additional features of the instrument being studied is a small (10"x10") IFU at 0.6" sampling with R~4000 and simultaneous observations from ~3600 to 23,000 Å, currently unprecedented at any 8m-class telescope. The IFU is an image slicer that can be plugged into the position of the usual long slit in the focal plane thus using the optics of the 8 channels the same way as long slit observations. A large number of science cases could profit from such an IFU both in Galactic and extragalactic astronomy. Since OCTOCAM will be especially suited to follow up any type of transient detected in large surveys or other wavelengths such as LSST, JWST or ALMA, the IFU can then be used to characterize their hosts and environments. In this talk I will present the design of the unit as well as some of the exciting science cases that can be done with such an IFU.

**Christina Thöne**

**Optomechanical design of OCTOCAM**

In this poster we will present the ongoing design of the OCTOCAM instrument, proposed as part of the Gemini Instrument Feasibility Studies. We will show our main design solutions as well as possible design trade-offs. We will discuss the different solutions to increase the spectral resolution, the IFU mode, and spectropolarimetric possibilities, with the intention of involving the Gemini scientific community in the final decision stages of the design study.

**Chris Tinney**

**The FunnelWeb Survey: A Spectrum of Every Southern Star down to I=12**

The FunnelWeb project has a simple goal - obtain a high signal-to-noise (S/N>100), moderate resolution (R~2200) optical spectrum of every star in the sky south of +10 degrees. The result will be the "HD Catalogue for the 21st Century" delivering spectral types, temperatures, metallicities, alpha-element abundances and youth signatures for 3 million stars by 2019.

**Alexander van der Horst**

**The Plethora of Science with OCTOCAM: Optical to Near-Infrared Imaging and Spectroscopy at High Time Resolution**

The next decade will be marked by the advent of large surveys, providing great promise for time-domain astronomy. This will be a unique opportunity for 8-meter class telescopes to efficiently follow-up and characterize new phenomena, and perform detailed studies of a broad range of sources. OCTOCAM has been proposed as a highly efficient workhorse instrument that optimizes the use of Gemini for broadband imaging and spectroscopy. It will be able to make deep images in 8 bands from the optical to the near-infrared, obtain a full spectrum from 370 to 2400 nm in a single shot, and all of this at a high time resolution with full frame rate reaching speeds of tens of Hz. This instrument will have a great impact on many different fields of astronomy, and in this presentation I will highlight some of them. OCTOCAM on Gemini will observe the first generation of stars and their environments through the first gamma-ray bursts at redshifts larger than 10; follow the evolution of the Universe throughout cosmological times observing galaxies at all redshifts; look for the origin of our solar system in comets, asteroids and transneptunian objects; perform detailed asteroseismology; and advance our understanding of the physics behind extreme phenomena such as supernovae, magnetars, and X-ray binaries. All of this is possible because OCTOCAM covers a unique region of the spectral resolution -- spectral coverage -- temporal resolution discovery space.

**Andrey Vayner**

**Multi-Wavelength View of Quasar Host Galaxies, now & in the future**

Understanding the interplay between supermassive black hole (SMBH) growth and galaxy formation is currently one of the most outstanding astrophysical questions. Quasars are ideal systems to directly observe the co-evolution phase, however it has been observationally challenging since quasars outshine their respective host galaxies by several orders of magnitude. The advent of near-infrared integral field spectroscopy (IFS) coupled with Adaptive Optics (AO) opens a new window for the detection of QSO hosts at high redshift. Making use of spectral and spatial information from the QSO IFS data cube provides the necessary “contrast” to detect their host galaxies and any subsequent star formation. Specifically, by utilizing the spatially unresolved emission from the QSO broad line region (e.g., H?), a PSF can be generated that can then be subtracted from the entire cube, leaving behind only host galaxy and extended narrow-line emission. We have conducted a pilot survey using Gemini-North's Near-Infrared Integral Field Spectrometer (NIFS) in combination with the laser guide star Altair AO system. I will present our PSF subtraction routine in detail and will show quasar-subtracted data. I will present the achieved flux and star formation limits as a function of separation from the quasar and compare these values to the achieved limits from Hubble imaging programs and Keck’s near-infrared IFS OSIRIS observations. Finally I will touch upon the science results from this pilot study and I will discuss future QSO host galaxy prospects using integral field spectrographs and adaptive optics in combination with Atacama Large Millimeter Array (ALMA) and the Jansky Very Large Array (JVLA).