
# POSTER ABSTRACTS

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# 1 Exoplanets

## 1.1 Orbits of Moving Group Binaries: Constraining the Ages of Young Moving Groups with Dynamical Masses of Binaries

**Eric Nielsen**

We describe our ongoing survey of close binaries in nearby, young moving groups to measure dynamical masses and use isochrones to derive ages and uncertainties for their host moving groups. Most directly imaged planets and brown dwarfs reside in these moving groups, and so accurately determining their ages directly impacts the inferred masses of these substellar companions. By combining new high resolution imaging from Gemini South/GPI, new RVs from SALT/HRS and Lick/APF, and archival measurements, we are obtaining resolved masses of these binaries. Our first results from the survey, V343 Nor Aa/Ab, resulted in mass measurements to better than 10% on both components, which when combined with the published results for GJ 3305, allowed us to derive an age of 26+/-3 Myr for the beta Pic moving group as a whole. We describe the status of the ongoing survey and the potential to apply this technique to other moving groups.

# 2 Galactic Astronomy

## 2.1 Gemini NIRI Adaptive Optic Imaging of the High Mass Star Formation Region W51 IRS 2

**Cassio Barbosa**

In this work we present the results of sub-arcsecond observations of a near infrared study of the massive star birth region W51 IRS2. The data were obtained with the NIRI camera assisted by adaptive optics at Gemini North observatory. Near infrared color-color and color-magnitude diagrams are presented in this study and they indicate the existence of two populations of embedded young objects corresponding to (H-K)~1.0 mag and (H-K)~1.5$ (+/-0.2) mag. The high spatial resolution images taken in J, H and K bands reveals the multiple nature of ultracompact HII region W51 d1} and allowed us to extract reliable fluxes for them. Considering the K-band magnitudes of the objects per se, our analysis provides the K-band luminosity function of the cluster that is complete to M~2$ $Msun (an A6 star) and reached the limit of 1 Msun (a G2 star).

## 2.2 Dynamical Masses of Cool Stars and Brown Dwarfs

**Trent Dupuy**

Evolutionary models are critical infrastructure in astrophysics, from massive stars to brown dwarfs and gas-giant planets. Because mass is the key dependent variable, the most direct tests of models use dynamical mass measurements. We present results from two long-term programs to measure masses in complementary ranges, from late-K stars to the bottom of the main sequence and from the bottom of the main sequence to methane-bearing T dwarfs. The cool star sample is focused on stars with low enough mass (<0.7 Msun) that they do not evolve significantly over the age of the Universe and thus form a tight mass–luminosity relation. The brown dwarf sample extends down to 30 Mjup, providing the strongest tests of substellar cooling tracks. Both samples use high-precision astrometry from Keck AO to determine orbits, and the brown dwarf sample also includes infrared astrometry from a decade-long program at the Canada-France-Hawaii Telescope to obtain photocenter orbits that enable individual mass measurements. The primary result from the cool star sample is an empirical mass–metallicity–magnitude relation that provides masses accurate to 4% or better from 0.7 Msun to 0.075 Msun using only K_S-band absolute magnitudes. Comparison of the empirical relation to models indicates that the impact of metallicity on K_S-band flux is observed to be significantly weaker than models predict. The brown dwarf masses probe the L/T transition in detail for the first time, revealing a remarkably weak dependence of luminosity on mass that implies substellar cooling decelerates as clouds disappear and reinforces the need for accurate cloud models. Overall, the brown dwarf masses validate modern substellar cooling models, and we derive brown dwarf cooling ages using the models to enable a novel direct determination of the

age distribution of field brown dwarfs (median age of 1.3 Gyr) that is consistent with a constant star formation history over 10 Gyr. Both samples are mostly lacking resolved optical photometry, so we anticipate that speckle imaging at Gemini with 'Alopeke and Zorro will open up more metallicity-sensitive tests as well as a mass–metallicity–magnitude relation in the newly vital Gaia bandpasses.

### 2.3 Three-dimensional shocks in Orion KL with IGRINS

**Heeyoung Oh**

In 2018A, Immersion Grating Infrared Spectrometer (IGRINS) is operated as a visiting instrument in Gemini South. We present the previous study toward Orion KL outflow with IGRINS on 2.7m Harlan J. Smith Telescope at the McDonald Observatory. IGRINS's ability with the large wavelength range in the NIR H & K bands and high spectral resolution of IGRINS (R ~ 45,000) observe over 35 shock excited H_2 transitions and give us a direct measure of the gas temperature and velocity as a datacube. Through a spectral mapping at the H_2 peak 1 area, we identified a total of 31 outflow fingers using datacube of H_2 1-0 S(1) 2.122 micron line. We constructed a three-dimensional map of fingers by estimating the inclination angles. The extinction difference (Delta A_V > 10 mag) between blue shifted and redshifted fingers indicates high internal extinction. The extinction and overall angular spread of the flow argue for an ambient medium with high density (10^5 cm^-3). In contrast to a complex geometry in peak 1, an additional mapping toward remarkable bow chains (HH 205 - HH 207) far outward from ejection center showed more clear view on shock physics of a single isolated bullet.
We also report the preliminary results from IGRINS/Gemini South from observation on May 2018, which study the nature of bow-shock with extremely High-velocity H_2 emission.

### 2.4 First Results from G4CS: The GeMS/GSAOI Galactic Globular Cluster Survey

**Thomas Puzia**

We present the first results from the GeMS/GSAOI Galactic Globular Cluster Survey (G4CS) of the Milky Way GCs NGC 3201 and NGC 2298. Using the Gemini South Adaptive Optics Imager (GSAOI) in tandem with the Gemini Multi-conjugate adaptive optics System (GeMS) on the 8.1-meter Gemini-South telescope, we have collected deep near-IR observations of the clusters, resolving their stellar populations down to Ks ? 21 Vega mag. The resulting photometric catalogues were combined with data from the Hubble Space Telescope to augment the photometric wavelength coverage for both clusters spanning the near-ultraviolet to near-infrared. We used the Ks vs. F606W?Ks and F336W vs. F336W?Ks color-magnitude diagrams to derive the stellar population ages, distances and reddening values for both clusters. We perform isochrone-fitting using three different isochrone library sets, deriving best-fit absolute ages of 12.17 ± 0.53 Gyr and 13.15 ± 0.42 Gyr for NGC 3201 and NGC 2298, respectively, utilizing the characteristic scale length defined as the color-luminosity difference between the lower main sequence knee and main sequence turn-off. Our derived parameters are in good agreement with recent age determinations of the two clusters, with our constraints on the ages ranking among the statistically most robust. These findings demonstrate the power of combining space-based HST measurements with ground-based AO-fed near-infrared photometry as a tool for the exploration of GC characteristics and their constituent stellar populations.

## 3 Instrumentation and Facilities

### 3.1 User's feedbacks with short surveys

**André-Nicolas Chené**

The Gemini Science User Support Department has begun direct dialog between the Observatory and its users by sending out routine Short Surveys (2–3 questions) at every critical phase of Gemini's user programs. The effort has several key objectives: 1) monitor the usefulness and usability of our software tools and documentation; 2) determine how well the observations went; and 3) assess how satisfied the Principal Investigator (PI) is with the data. Another objective is to identify actionable items that can

improve the whole observing process at Gemini. In brief, the Short Surveys provide a direct way to listen to what is most important to our user community.
This poster summarizes the method used to prepare, launch and analysis the surveys, and present the first results with their impacts on recent changes in user support.

### 3.2 Upgrading the Gemini planet imager: GPI 2.0

**Jeffrey Chilcote**

The Gemini Planet Imager (GPI) is the dedicated high-contrast imaging facility, located on Gemini South, designed for the direct detection and characterization of young Jupiter mass exoplanets. In 2019, Gemini is considering moving GPI from Gemini South to Gemini North. Analysis of GPI's as-built performance has highlighted several key areas of improvement to its detection capabilities while leveraging its current capabilities as a facility class instrument. We will present the proposed upgrades including a pyramid wavefront sensor, broadband low spectral resolution prisms and new apodized-pupil Lyot coronagraph designs all of which will enhance science and enable new science programs.

### 3.3 The impact of Gemini Observatory in Canada

**Stephanie Côté**

In view of the Gemini Assessment Point in November 2018, at which the Gemini participants are to declare their interest in renewing the Gemini Agreement, the Canadian Gemini Office has conducted a review of all the outcomes of Canada's participation in the Gemini Observatory over the past decade in order to provide an independent perspective on the benefits that have accrued to the Canadian Astronomical Community and to Canada as a whole. The poster will present some of the highlights from this review, such as:

- It was found that the overall science Impact of Canadian Gemini papers (based on citations) is higher than the Gemini average, and in fact is higher than any other 8m class telescope worldwide; the Canadian papers with the highest mean impact are using GPI.
    - the number of PhD theses produced in Canada based on Gemini data is higher than any other astronomical facilities to which Canadians have access to; since 2009 there is an average of 4.9 Gemini Canadian thesis per year;
- Canadian astronomers are leaders or collaborators on half of all science press releases released by the Gemini Observatory. Most of the Canadian press releases are from GMOS users, however the press releases with the most impact (in terms of visits) are from GPI users.
- There were 33 internships of Canadian co-op students at Gemini since 2009.

### 3.4 Gemini Instrument Upgrade Program

**Ruben Diaz**

The Gemini Observatory remains committed to keeping its operational instrumentation competitive and serving the needs of its user community. Currently the observatory operates a 4 instruments + 1 AO system at each site. At Gemini North the GMOS-N, GNIRS, NIFS and NIRI instruments are offered supported by the ALTAIR AO system. In the south, GMOS-S, F-2, GPI and GSAOI are offered instrumentation and GeMS is the provided AO System. This presentation describes our strategy to continuously upgrade our current instruments to provide for evolving user needs, improve their performance, and extend their viable lifetimes. We examine both our current funded upgrade projects and our potential future enhancements.

### 3.5 Setting the stage for a FAST upgrade of the GPI calibration system

**Benjamin Gerard**

Direct detection and detailed characterization of exoplanets using extreme adaptive optics (ExAO) is a key science goal of future extremely large telescopes. However, quasi-static wavefront errors will limit the sensitivity of this endeavor. Additional limitations for ground-based telescopes arise from residual AO-

corrected atmospheric wavefront errors, generating short-lived aberrations that will average into a halo over a long exposure, also limiting the sensitivity of exoplanet detection. We develop the framework for a solution to both of these problems using the self-coherent camera (SCC), to be applied to ground-based telescopes, called Fast Atmospheric SCC Technique (FAST). This work sets the stage for a FAST approach on GPI 2.0, upgrading the current calibration system. Simulations show that for typical ExAO targets the FAST approach can reach ~100 times better in raw contrast than what is currently achieved with GPI if we extrapolate for an hour of observing time. Sensitivity improvement from this method could play an essential role in the future ground-based detection and characterization of lower mass/colder exoplanets. Future work will specifically address the requirements for a FAST GPI upgrade.

### 3.6 DRAGONS - Gemini's Next Generation Data Reduction Software

**Kathleen Labrie**

DRAGONS, Data Reduction for Astronomy from Gemini Observatory North and South, is Gemini's new Python-based data reduction platform. DRAGONS offers an automation system that allows for hands-off pipeline reduction of Gemini data, or of any other astronomical data once configured. The platform also allows researchers to control input parameters and in some cases will offer an interactive portal for optimization of some data reduction steps.

DRAGONS currently operates in Quality Assessment mode (QA) at the telescopes every night, returning sky condition metrics like Image Quality (IQ), Cloud Cover (CC), and Background (BG) as measured on any image, including acquisition images. This helps the observers manage the queue. At the end of this year, DRAGONS will be released to the public and approved for science quality reduction of imaging data from all the active facility instruments. DRAGONS, along with the Gemini Observatory Archive (GOA), will be central to Gemini's LSST follow-up system by reducing imaging and longslit data at night and feeding the products back into the system for evaluation.

Over time, the aim is to have DRAGONS replace the Gemini IRAF package, at least for active facility instruments. Data reduction software for new facility instruments are already required to use DRAGONS.

## 4 The Nearby Universe

### 4.1 The central beating heart in the Sculptor massive galaxy

**Ruben Diaz**

The dominant spiral galaxy in the Sculptor Group is the closest massive galaxy with a superwind driven by a nuclear starburst. NGC 253 (M_I ~ -22.4, D ~ 2.6 Mpc) has a strong outflow that will exhaust its nuclear star forming gas in ~100 Myr, influencing the evolution of the galaxy. The nature of the starburst remained unclear because there are no obvious companion galaxies or disk distortions. Moreover, the central region is veiled by large amounts of dust hiding the true dynamical nucleus to the point that there was no clear evidence that the galaxy harbours a supermassive black hole co-evolving with the starburst. We have taken deep infrared images and K-band spectra along the major axis of the central structure and through the brightest infrared source. 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. It is the most massive compact infrared object in the central region, located at 2.0?? of the symmetry center of the revealed galactic bar, and is surrounded by a large circumnuclear stellar disk. High special resolution mid-infrared imaging and the kinematic residuals in the H2 rotation curve are consistent with an outflow emanating from the position of this off-center nucleus. Also, the Br? emission line profile is pronounced blue-shifted and this emission line has also the highest equivalent width at this position. All these evidences point out TH7 as the best candidate to be the galactic nucleus of NGC 253 and the source of the global outflow. These observations support theoretical scenarios for gas-rich barred galaxies modelled at sub-parsec resolution, predicting that the lack of symmetry in the mass distribution triggers the formation

of gas clumps which form stars or get disrupted, providing a mechanisms for angular momentum removal. Supernovae shells and filaments also contribute in the angular momentum removal of the gas and the feeding of the massive central beating heart of NGC 253, which seems to be growing at the same time it contributes to the evolution of the whole galaxy.

### 4.2 Tracing the Assembly History of NGC 1395

**Carlos Escudero**

In the scenario of galaxy formation, it is clear that major fusions and tidal interactions play important roles. In the paradigm of hierarchical ?CDM structure formation, massive early-type galaxies we see in the local Universe would have been built through a combination of two phases: in situ and ex situ formation. These two phases should leave their signatures both in their inner regions and in their halos. In this context, globular clusters (GCs) have proved to be important tools for examining the early stages of galaxy formation, and also to trace major star forming episodes in a galaxy.
We used deep Gemini-South/GMOS g'r'i'z' images to study the GC system of the massive elliptical galaxy NGC1395, located in the Eridanus supergroup. The photometric analysis of the GC candidates reveals a clear colour bimodality distribution, indicating the presence of "blue" and "red" GC subpopulations. While a negative radial colour gradient is detected in the projected spatial distribution of the red GCs, the blue GCs display a shallow colour gradient. The blue GCs also display a remarkable shallow and extended surface density profile, suggesting a significant accretion of low-mass satellites in the outer halo of the galaxy. Regarding NGC1395 itself, the analysis of the deep Gemini/GMOS images shows a low surface brightness umbrella-like structure indicating, at least, one recent merger event. Recently, GMOS longslit observations were obtained from this galaxy. We will show here preliminary results of the stellar population analysis performed in the central region of NGC1395.

### 4.3 The globular cluster system of NGC 1395: combining optical and near infrared photometry

**Favio Faifer**

We present preliminary results of the analysis of Flamingos-2 and GMOS-S photometry of the globular cluster (GC) system of the elliptical galaxy NGC 1395. The study is based on deep NIR images in two different bands (J and Ks) and high quality optical g', r', i' and z' frames. This data set allowed us to obtain different color indexes for several hundreds of GC candidates, and to make an initial assessment of the presence or absence of multiple GC populations in 2D planes of colors.

### 4.4 Near-infrared imaging and spectroscopic observations of supernova remnants in M33

**Ho-Gyu Lee**

We present near-infrared imaging and spectroscopic observations of supernova remnants (SNRs) in M33. The SNRs are firstly detected by UKIRT near-infrared [Fe II] and H2 narrow band imaging of M33. For the detected SNRs, we perform follow-up spectroscopic observations using GNIRS on Gemini. The shock-heated SNR is clearly detected in the narrow band [Fe II] image, while the photoionized giant H II region is undistinguished even to the larger scale. We also detect H2 emission for some of the SNRs, suggesting that the SNRs are interacting with molecular clouds and significantly impact their surrounding conditions. We compare our results to the cases of SNRs in Milky Way. The spatially resolved distributions of two emission lines indicate that the line-emitting gases are in different conditions, resulting from the influence of evolution of massive star through stellar wind and interaction with surrounding.

## 5 Cosmic Explosions

### 5.1 The Evolution of the Infrared Spectrum of the Type IIP SN2017eaw: Nucleosynthesis and CO and Dust Formation

**Tom Geballe**

Whether core-collapse supernovae (ccSNe) are a significant source of dust in the Universe is a long-standing question. Large quantities of dust are observed in high-z galaxies. AGB stars, which produce

most of the dust in the present day Milky Way and other galaxies, would not have existed at high z. However, SNe from massive stars occur just millions of years after their progenitors formed; and in principle could have provided the dust observed in the early universe. In the nearby universe very few of the most common types of ccSNe have been observed in the infrared during the later stages when dust is predicted to form. Here we report nine sets of high quality near-infrared (0.8 - 2.5 microns) spectra of the Type IIP supernova, SN 2017eaw, using GNIRS on Gemini North. The spectra, which span the time interval 22-205 days after discovery, show the onset of molecule (CO) and dust formation, as well as the progression of nucleosynthesis, and lend support to ccSNe being a significant source of dust at high z.

# 6 Active Galaxies and Quasars

## 6.1 NGC 6744 - A nearby Milky Way twin with a very low luminosity AGN

**Patricia da Silva**

NGC 6744 is the nearest and brightest South-hemisphere galaxy with morphological type similar to that of the Milky Way. Using data obtained with the Integral Field Unit of the Gemini South Multi-Object Spectrograph, we found that this galaxy has a nucleus with LINER (Low Ionization Nuclear Emission Line Region) surrounded by three line emitting regions. The analysis of the Hubble Space Telescope archival images revealed that the nucleus is associated with a blue compact source, corresponding probably to the Active Galactic Nucleus (AGN). The circumnuclear emission seems to be part of the extended Narrow Line Region of the AGN. One of these regions, located 1" southeast of the nucleus, seems to be associated with the ionization cone of the AGN. The other two regions are located 1" south and 0.5" northeast of the nucleus and are not aligned with the gaseous rotating disk. Spectral synthesis shows evidence that this galaxy may have gone through a merger about 1 billion years ago. On the basis of the kinematic behavior, we found a gaseous rotating disk, not co-aligned with the stellar disk. Given the relative degree of ionization and luminosities of the nuclear and circumnuclear regions, we suggest that the AGN was more luminous in the past and the current circumnuclear emissions are echoes of that phase.

## 6.2 GMOS IFU observation of a wandering black hole in NGC 5252

**Minjin Kim**

We recently found an ultraluminous X-ray source in NGC 5252, which is a possible candidate of an off-nuclear non-stellar mass black hole. We present a follow-up study of the optical IFU spectrum obtained with GMOS-N. Using the IFU data, we again confirm that the redshift of the ionized gas at the position of the ULX coincides with that of NGC 5252. The spectroscopic information of the ionized gas around the ULX reveals that the gas is rotating with the ULX. This findings possibly indicates that the ULX is NOT a background source, but the actual ionizing source of the surrounding gas. It supports the idea that the ULX is an off-nucleus AGN associated with NGC 5252. We find the maximum velocity of the rotating gas is relatively small, indicating that the progenitor of the ULX can be a nucleus of a dwarf galaxy.

## 6.3 A GMOS-IFU Spectroscopy of Post-Starburst Galaxies: On the Spatial Distribution of Young Stellar Population

**Gwang-Ho Lee**

Post-starburst galaxies are an ideal laboratory to investigate the details of the transition phase. Their spectra reveal a phase of vigorous star formation activity, which is abruptly ended within the last 1 Gyr. Numerical simulations predict that the starburst, and thus the current A-type stellar population, should be localized within the galaxy's center (< kpc). Yet out GMOS IFU observations (GN-2015B-Q-15, PI: Gwang-Ho Lee) show otherwise; all five post-starburst galaxies in our sample have Hdelta absorption line profiles that extend well beyond the central kpc. Most interestingly, we found a negative correlation between the Hdelta gradient slopes and the fraction of the stellar mass produced during the starburst, suggesting that stronger starbursts are more centrally-concentrated. I will discuss the results in relation with the origin of post-starburst galaxies**.**

### 6.4 Mapping feeding and feedback of nearby Supermassive Black Holes

**Gabriel Sousa dos Santos**

Nuclear activity in galaxies are crucial phases in the evolution of galaxies in which the central supermassive black hole is being fed by mass from its surroundings and the resulting feedback may affect the further evolution of galaxies. In order to quantify the mass-flow rates and the corresponding feedback power, we have used the GMOS IFUs to survey the gas kinematics within the inner kiloparsec of a sample of 24 nearby active galaxies. We present partial results that comprise the mapping and modelling of channel maps along the emission-line profiles of the high excitation [OIII]5007A emission line and the [NII]6584A lower excitation line for a few galaxies of the sample. We compare the gas kinematics of these two gas species and look for signatures of non-circular motions of inflows and outflows, calculating the mass flow rates and kinetic powers of the outflows. We will also present movies that were created from the channel maps, where it is possible to visualize the high and low excitation gas spatial distribution and their flow in the inner kpc.

### 6.5 Potential for Quantum-Mechanical Tests Using Quasars, as Illuminated by Gemini Archival Data

**Eric Steinbring**

There has been recent interest in quantum-mechanical tests aided by distant quasars. For two of sufficient redshift at opposite directions on the sky, light-travel-time arguments can assure the acausality of their photons. And if those are used to set parameters in an Earth-based apparatus, coincidence cannot be due to their communication, closing the so-called "freedom of choice" loophole in the experiment. But this assumes no other interference right up to detection, including correlated instrumental errors, which must be carefully constrained. The Gemini North and South Multi-Object Spectrograph (GMOS) twins can simultaneously view pairs of quasars up to 180 degrees apart on the sky, and already provide a significant baseline record to investigate this. All GMOS broadband imaging frames were searched to find those that happen to contain a known quasar together with a suitable comparison star. Although individual photometry can be noisy among these $0.1 < z < 6$ sources, in the aggregate, average site conditions and their relative photometric zeropoints are well characterized. The resulting dataset constitutes about 1.7 million correlated quasar-observation pairs over 14 years. A preliminary analysis of that is presented, with the intriguing result that paired-flux differences across the whole sky weakly deviate from flatness, to the limit consistent with Bell's Theorem. Can Gemini be used to prove the "spooky action at a distance" expected of quantum mechanics? Some prospects for future work and a more definitive test are considered.

## 7 Distant Galaxies and Cosmology

### 7.1 Globular cluster systems of massive elliptical galaxies in low-density environments with GMOS data

**Lilia Basino**

The aim of the present work is to disentangle the evolutionary history of massive elliptical galaxies located in low-density environments, through the characterization of their globular cluster systems (GCSs). In particular, we focus on bright ellipticals, typical of cluster environments rather than of the poor groups they inhabit, which might show signs of interaction with their neighbors. We present two photometric studies corresponding to the GCSs of NGC 6876 and NGC 3613, based on GMOS g', r', i' images obtained with Gemini South and North, respectively. Both GCSs show bimodal color distributions, i.e. with metal-poor and metal-rich globular clusters (GCs). Their most distinctive properties are:

i) in NGC 6876, the GCS turned out to be more extended and much more populated (~8100 GCs) than expected, being the metal-rich GCs clearly more concentrated towards the host galaxy than metal-poor ones.

ii) in NGC 3613, the projected distribution of metal-rich GCs traces the host galaxy surface-brightness distribution (i.e. its stellar population), both describing ellipses with similar eccentricity and position angle.
The differences between these two systems show the important role played by the evolutionary history of galaxies in the constitution of their GCSs.

### 7.2 Spectroscopy of Early-Type Host Galaxies of Type Ia Supernovae : the YONSEI Project

**Yijung Kang**

The origin of the well-known correlation between Hubble residual of Type Ia Supernova (SN Ia) and mass of their host galaxies is yet to be understood. In order to investigate this more directly, we have initiated the YOnsei Nearby Supernova Evolution Investigation (YONSEI) project. We found a significant (~3.9 sigma) correlation between host galaxy mass and population age from high S/N host spectra observed using CO 2.5 m telescope. For the next steps of the project, we have subsequently observed more sample of early-type host galaxies at $0.1< z < 0.5$ with Gemini 8.1m and MMT 6.5 m telescopes, including GMOS-N & S observations in 2015B and 2016A semester via K-GMT science program. The data set from this continuing survey will be combined with our nearby sample to investigate the luminosity evolution of SNe Ia by looking into the correlation between Hubble residual and population age. In this presentation, we will report our progress and show the preliminary results on this project, and also address the future plans for our SNe Ia host studies.

## 8 Other

### 8.1 The role of the US National Office in the Gemini partnership

**Letizia Stanghellini**

When the Gemini Observatory was created each partner country agreed to sponsor a national office to represent their user community. The US National Gemini Office (US NGO) is based at NOAO and is currently made up of a small, 1.5 FTE, group of scientific staff. We discuss the changes the US NGO has undergone since the origin of the Gemini project nearly three decades ago. Nationally funded facilities are under financial pressure, as new project must be funded from a nearly fixed budget. We discuss how the US NGO should be used to advocate for both the US community and the Gemini Observatory. This role could be an essential one in protecting open access to 8m-class facilities.