Cross-Collserola PhD Meeting in Astrophysics, Cosmology and Particles 2024

Report of Contributions

Contribution ID: **1** Type: **not specified**

Reception

Friday 4 October 2024 09:25 (20 minutes)

Time for informal talks and getting your accreditations! Also, put up your poster!

Contribution ID: **2** Type: **not specified**

Welcome!

Friday 4 October 2024 09:45 (15 minutes)

Welcome talks from the SOC and institute directors.

Contribution ID: **43** Type: **Abstract**

Magnetic winding and turbulence in Hot Jupiters

Friday 4 October 2024 12:50 (10 minutes)

INTRODUCTION

Hot Jupiters (HJs) are gas giants orbiting very close to their host stars, with orbital periods of a few days, corresponding to distances within about 0.1 AU. Due to the high irradiation from their host stars and the tidal locking of the rotational and orbital periods, strong temperature differences persist between the dayside and the nightside. This triggers strong thermal zonal jets that tend to redistribute the heat, as shown in global circulation models (GCMs).
Most HJs have inflated radii, up to double of what cooling models for planetary evolution predict. A strong correlation with the irradiation is observed, with inflation starting to appear for equilibrium temperatures above about Teq = 1000 K. However, the effects of irradiation alone are not quantitatively sufficient to explain the large radii inflation, given the shallowness of the absorbing layer of the radiation. Therefore, the most probable explanation is the continuous deposition of some additional heat.
Among the possible physical mechanisms, one of the most popular is Ohmic heating due to the dissipation of currents induced by the magnetic field which is produced by the zonal winds composed of ionized material. The Ohmic mechanism fits the inferred efficiency trend above: as the irradiation increases, the conductivity and the induced currents increase monotonically, until the generated magnetic fields are strong enough to slow down the global zonal winds via magnetic drag, thus self-regulating the system and limiting the overall efficiency of the mechanism

Most existing studies considered semi-analytical estimates within the linear regime of the induction, i.e. when the atmospheric dynamics produces a small perturbation over the background magnetic field generated in the interior. This approach is valid for relatively low conductivities, corresponding to temperatures T < 1500 K. For higher temperatures, the induced magnetic field is locally so high that the linear approximation fails. Our project focuses on simulations that can connect both regimes.

OHMIC DISSIPATION STUDY

As a first step, in our first work we focused on the non-linear regime, i.e. when the induced magnetic fields are comparable or larger than the internal ones. We presented local ideal MHD simulations of a narrow atmospheric column in the dayside radiative layers of a HJ upper atmosphere (1 mbar-10 bar), which can be seen as an extension of the earlier non-magnetic studies. We included realistic, parametrized profiles for the wind velocity, mimicking the steepest profiles of GCMs and turbulent perturbations. We found that, under conditions that are typical of ultra hot Jupiters (T > 3000 K), a strong toroidal field (of the order of several hundred gauss) is created in the shear layer, confined by meridional currents. Moreover, turbulent small-scale structures induce further currents in deeper regions, but more detailed simulations were needed to assess this clearly.

In this second work, we go a step further to quantify such dissipation, we study the combined effect of winding and atmospheric turbulence. We use realistic profiles for the wind velocity and pressure, obtained from GCM simulations, for different exoplanets. We also include realistic conductivity, which depends on temperature and pressure and can be approximated by classical formulae for the potassium contribution, dominant for the typical HJ. We consider the modelling of four concrete exoplanets, as an application: two moderately irradiated (HD209458b, HD189733b), and two highly irradiated (WASP18b, WASP121b).

RESULTS AND CONCLUSIONS

In our simulations we observed modifications to the profiles and intensities of magnetic fields and currents, compared to both the ideal MHD scenario and the linear regime, especially for intermediate T of about 1500-2000 K, where the bulk of observed HJs lies, due to the winding effect. Such profiles change within the same planet, having a more extreme profiles (in terms of shear of the zonal wind) close to the substellar point, and being more mild at different latitudes and longitudes.

On the other hand, 1D simulations give us information about the winding effect and the amplification of the magnetic field as seen before, however full 3D simulations are very important, since they provide us with information about the amount of currents that can eventually penetrate the convective region below the radiative-convective boundary (RCB) for different cases due to perturbations. These simulations have found that the extremely strong electrical currents generated can be sufficient to account for the observed inflation of HJs' radii, provided these currents reach the inner layers. Furthermore, magnetic fields in the hottest planets can reach up to kilogauss levels locally around shear layers, with significant variability in induced currents influenced by local planetary temperatures. This work lays the groundwork for future studies on the radio detectability of these features.

Primary author: SORIANO GUERRERO, Claudia (Institut de Ciències de l'Espai)

Presenter: SORIANO GUERRERO, Claudia (Institut de Ciències de l'Espai)

Session Classification: Morning talks

Track Classification: Talks

Contribution ID: **44** Type: **Abstract**

The Holographic QCD Running Coupling Constant from the Ricci Flow

Friday 4 October 2024 13:00 (10 minutes)

Through a holographic model of QCD, we present a phenomenological approach to study the running of the strong coupling constant αs in both non-perturbative and perturbative regimes. The renormalization of the metric tensor, driven by the Ricci Flow, and the breaking of conformal and chiral symmetries – thanks to introducing a double dilaton model and large-Nc corrections – allow us to relate the existence of an infrared fixed point in the coupling constant with a smooth matching to pQCD well above 2 GeV. The proposed dilaton model yields linear Regge trajectories and vector decay constants similar to their experimental counterparts.

Primary authors: CANCIO ANDEL, Héctor (IFAE); Dr MASJUAN, Pere (IFAE)

Presenter: CANCIO ANDEL, Héctor (IFAE)

Session Classification: Morning talks

Track Classification: Talks

Contribution ID: **45** Type: **Abstract**

Hints for auroral and magnetospheric polarized radio emission from the scallop-shell star 2MASS J05082729 − 2101444

Friday 4 October 2024 10:40 (10 minutes)

Scallop-shell stars are a recently-discovered class of young M dwarfs showing complex optical light curves, characterized by
periodic dips and additional features stable over tens to hundreds of rotation cycles, whose origin is not understood. 2MASS
J05082729−2101444 is a ~25 Myr-old scallop-shell star identified using TESS data, with photometric period of 6.73 h attributed
to rotation. Among the ~50 recently confirmed scallop-shell stars, it is one of the few detected at radio frequencies between 1–8
GHz. We observed this rare system with the upgraded Giant Meterwave Radio Telescope at 570–725 MHz, covering 88% of the
photometric period in each of the two observations scheduled almost a month apart in 2023. We have detected ~mJy emission from
the target in both epochs, with significant circular polarization fraction |V/I| ~20–50%. The 3.5-min phase-folded light curves reveal
unique variability in circular polarization, showing an ~ hour-long helicity reversal in both epochs, similar in amplitude, length, and
possibly phase. These results suggest two emission components: a persistent moderately polarized one and a highly polarized, short
burst-like component, likely due to electron cyclotron maser (ECM), indicative of auroral emission and potentially responsible for
the helicity reversal. I'll present these uGMRT observations and discuss the scenarios responsible for the observed behavior.

Primary author: KAUR, Simranpreet (Institute of Space Sciences (ICE-CSIC), Barcelona)

Presenter: KAUR, Simranpreet (Institute of Space Sciences (ICE-CSIC), Barcelona)

Session Classification: Morning talks

Track Classification: Talks

Contribution ID: **46** Type: **Abstract**

Nanoindentation of lunar basalts: mechanical proeprties of the NWA 12008 meteorite

Friday 4 October 2024 10:00 (10 minutes)

Introduction: Nanoindentation is a powerful quasi-nondestructive technique in which the sample is indented with a nanometer-sized sharp end. The amount of displacement as a function of the applied load is parametrized to extract its local mechanical properties. This technique is widely used in material science as it is arising as a promising tool for extraterrestrial material characterization. In this work, we analyze the mechanical properties of olivine ((Mg,Fe)2SiO4) in the highly-shocked NWA 12008 lunar basalt.
Technical procedure: Nanoindentation was conducted with an Anton-Paar nanoindenter (NHT2 model) with a Berkovich tip (diamond pyramidal-shaped). A total of 92 nanoindentations were performed in 5 regions of the sample. Minerals were identified by SEM-EDX using a Hitachi TM4000plus tabletop microscope equipped with a Bruker EDX detector. Around one third of the nanoindentations turned out to be too close to fractures in the NWA 12008 meteorite. Data from those regions were not considered for the present study. We also conducted 91 additional nanoindentations of terrestrial olivines to act as sample control.
Results and discussion: Olivine hardness in NWA 12008 is sizably lower than that measured in terrestrial olivine crystals and also in the Chelyabinsk meteorite. On the other hand, olivine in NWA 12008 also appears to be more elastic (smaller elastic modulus) than in the Earth counterparts, but more similar to that from Chelyabinsk meteorite. Thus, it appears that the mechanical properties of olivine do depend on the origin of its host rock (terrestrial, lunar or asteroidal). We consider that lunar mineral intrinsic porosity or a high microfracture degree may induce such differences.

Primary author: GRÈBOL-TOMÀS, Pau (Institut de Ciències de l'Espai (ICE-CSIC))

Co-authors: Dr PEÑA-ASENSIO, Eloy (Politecnico di Milano); Prof. TRIGO-RODRÍGUEZ, Joep Maria (Institut de Ciències de l'Espai (ICE-CSIC)); Dr IBÁÑEZ-INSA, Jordi (Geociències Barcelona (GEO3BCN-CSIC))

Presenter: GRÈBOL-TOMÀS, Pau (Institut de Ciències de l'Espai (ICE-CSIC))

Session Classification: Morning talks

Track Classification: Talks

Contribution ID: **47** Type: **Abstract**

Testing the robustness of the BAO determination in the presence of massive neutrinos

Friday 4 October 2024 10:10 (10 minutes)

The Baryon Acoustic Oscillation (BAO) feature is one of the main probes of cosmology today. It makes it possible to infer the expansion history of the universe through galaxy clustering. Throughout the standard analysis pipeline for measuring the BAO, reference cosmological models are assumed to enhance and model the signal. Current surveys such as DESI claim a precision of 0.52% on the BAO scale, accounting for a 0.1% bias that might be introduced due to the assumption of an incorrect fiducial cosmology. While this impact has been studied for a wide range of ΛCDM models, it hasn't yet been tested with the precision afforded by next generation surveys, for the presence of massive neutrinos. In this context, we have employed the Quijote high-resolution simulations with different neutrinos masses, mν[eV] = 0, 0.1, 0,2, 0.4 to study and quantify the impact of the pipeline's built in assumption of massless neutrinos on the measurement of the BAO signal, with a special focus on the BAO reconstruction technique. In this talk, I will discuss the results of our work.

Primary author: NADAL MATOSAS, Adriana (ICCUB)

Presenter: NADAL MATOSAS, Adriana (ICCUB)

Session Classification: Morning talks

Track Classification: Talks

Contribution ID: **49** Type: **Abstract**

Concurrent spectral and light curve synchro-curvature modelling of pulsars

Friday 4 October 2024 13:10 (10 minutes)

In this talk I will present the current status of our development of an effective radiative model versatile enough to be applied to hundreds of pulsars. The model follows the dynamics of charged particles being accelerated in the magnetosphere of a pulsar and computes their emission via synchro-curvature radiation, with only three free effective parameters involved. The model has succeeded in fitting the gamma-ray spectra of the whole population of gamma-ray pulsars and reproduces well a majority of those pulsars that also have detected non-thermal X-ray pulsations. Complementary to the spectral model, for which we have incorporated several improvements related to the description of the acceleration region, a geometrical representation allows to build synchro-curvature emission maps from which light curves can be obtained. The sample of theoretical light curves created presents features very similar to the zoo of observational gamma-ray light curves of pulsars, in terms of morphology, number of peaks and widths of the peaks. We find a general agreement in global properties with several main conclusions: Among them 1) that the detection probability due to beaming is much higher for orthogonal rotators (approaching 100 per cent) than for small inclination angles (less than 20 per cent), 2) that the small variation in the synthetic skymaps generated for different pulsars indicates that the geometry dominates over timing and spectral properties in shaping the gamma-ray light curves.

Primary author: ÍÑIGUEZ-PASCUAL, Daniel

Presenter: ÍÑIGUEZ-PASCUAL, Daniel

Session Classification: Morning talks

Track Classification: Talks

Contribution ID: **50** Type: **Abstract**

Anomalous Photon Self-Couplings in Born-Infeld Theory: Implications for the Muon Magnetic Anomaly

Friday 4 October 2024 10:30 (10 minutes)

The anomalous magnetic moment of the muon, $a_\mu = (g-2)_\mu/2$, remains a significant discrepancy between theoretical predictions and experimental observations, indicating possible physics beyond the Standard Model. We explore the nonlinear Born-Infeld Lagrangian, characterized by a quartic photon self-interaction, to reconcile these differences. By calculating contributions from light-by-light scattering and vacuum polarization, and adjusting the Born-Infeld parameter using experimental data, we aim to resolve the $4-5\sigma$ anomaly. Our approach not only narrows the gap between theory and experiment but also establishes a strong lower limit for the Born-Infeld parameter β, highlighting its potential to reveal new physics. Furthermore, we emphasize that our obtained lower limit for the Born-Infeld parameter exceeds those found in previous studies and are particularly relevant for certain Beyond Standard Model scenarios, where mass scales are expected to fall within a similar range ($\mathcal{O}$(TeV)).

Primary authors: DUCH MARIA, Balma (IFAE); Prof. MASJUAN, Pere (IFAE)

Presenter: DUCH MARIA, Balma (IFAE)

Session Classification: Morning talks

Track Classification: Talks

Contribution ID: **53** Type: **Abstract**

Measuring Galaxy Shapes with Deep Learning

I'm developing a method to measure galaxy shapes, which are used for weak lensing shear cosmology, using deep learning techniques. I use a convolutional neural network (CNN) to measure galaxy ellipticities from input images of simulated galaxies. The method includes PSF correction and calibration of the weak lensing shear using a method called Metacalibration.

Poster

No

Primary author: REYNOLDS, Lucy

Presenter: REYNOLDS, Lucy

Session Classification: Morning talks

Track Classification: Talks

Contribution ID: **54** Type: **Abstract**

Quarkonium: spectrum and decays

Friday 4 October 2024 10:50 (10 minutes)

Quarkonium, a bound state of a quark and antiquark, offers valuable insights into the strong interaction. Recent discoveries of exotic hadrons, such as hybrids, provide new opportunities to explore QCD beyond conventional quark models. This work explains quarks and hadrons while examinings very lightly the spectrum and decays of quarkonium-like exotic states.

Poster

No

Primary author: TOMÀS VALLS, Sandra (ICCUB)

Co-author: SOTO, Joan (Universitat de Barcelona)

Presenter: TOMÀS VALLS, Sandra (ICCUB)

Session Classification: Morning talks

Track Classification: Talks

Contribution ID: **55** Type: **Abstract**

Design and performance of the LISA Radiation Monitor

Friday 4 October 2024 12:30 (10 minutes)

LISA will be the first space-based gravitational wave observatory to scan the entire sky, offering novel insights into low-frequency gravitational waves (0.1 mHz - 1 Hz). It consists of three interferometer arms, each with its own free-falling test masses (TMs). High-energy particles from the radiation environment interacting with the LISA spacecrafts can induce a net charging rate in the TMs, resulting in acceleration noise. To prevent false signals, it is important to monitor variations in the cosmic-ray flux and solar energetic particle (SEP) events. For this purpose, we have designed a Radiation Monitor capable of detecting protons and alpha particles above ~70 and ~600 MeV, respectively. It will allow monitoring variations in the cosmic-ray flux with ~1% statistical error in ~1 hour and detect the high-energy component of SEPs. This Radiation Monitor consists of a telescopic arrangement of four plastic scintillators and three W absorbers in between them. The scintillators are coupled to silicon photomultipliers (SiPMs) and their readout is performed by the BETA ASIC, which can amplify, shape and digitise the signals of up to 64 channels with a power consumption of ~1mW/ch. We will present the Radiation Monitor design, the results of its performance evaluation through Geant4 simulations and its calibration with experimental data.

Poster

No

Primary author: ORTA TERRÉ, Marina (ICC)

Co-authors: ESPIÑA ROJAS, Albert; SANUY, Andreu (University of Barcelona); GUBERMAN, Daniel (ICCUB); MAZZANTI, David (Institut de Ciències del Cosmos (ICCUB)); ROMA, David (IEEC); MARTÍ, Laura (IEEC); NOFRARIAS, Miquel (IEEC); CATALÀ MEJIAS, Roger (UB)

Presenter: ORTA TERRÉ, Marina (ICC)

Session Classification: Morning talks

Track Classification: Talks

Contribution ID: **57** Type: **Abstract**

Near-infrared cosmology with type Ia supernovae

Friday 4 October 2024 13:20 (10 minutes)

Type Ia supernovae (SNe Ia) are thermonuclear explosions resulting from white dwarfs that have exceeded the Chandrasekhar limit of 1.44 solar masses.

In near-infrared (NIR) wavelengths, these SNe are nearly standard candles even before correcting for light-curve shape and reddening, and can with high precision be used as distance estimators to their host galaxies.

In this talk, I will describe some of the techniques we use to determine the brightness of a SN in the local Universe at redshifts less than 0.1.
This includes how the raw telescope images are processed, how we determine the brightness of the SN at a given epoch, determination of the peak brightness of the SN and constructing a Hubble diagram.

Poster

No

Primary author: PHAN, Kim (ICE-CSIC)

Presenter: PHAN, Kim (ICE-CSIC)

Session Classification: Morning talks

Track Classification: Talks

Contribution ID: **58** Type: **Abstract**

Mitigating stellar activity to characterise exoplanet atmospheres

Friday 4 October 2024 11:10 (10 minutes)

With the James Webb Space Telescope (JWST) ushering in a new era of exoplanet observations, accurately characterising exoplanet atmospheres is more crucial than ever for understanding their chemical compositions and potential habitability. A key observational technique for this is transmission spectroscopy, which measures the wavelength-dependent decrease in starlight as an exoplanet transits its host star. These variations in transit depth—the fraction of starlight blocked by the planet—across different wavelengths produce a transmission spectrum, which encodes information about the planet's atmospheric properties. However, stellar activity—such as spots, faculae, and convective granulation patterns on the stellar surface—introduces additional wavelength-dependent variations that can contaminate the observed transmission spectrum. These stellar signals can mimic or obscure the atmospheric signatures of the planet, complicating the accurate retrieval of atmospheric properties.

To address these challenges, we employed a comprehensive approach by conducting multi-band photometric and spectroscopic monitoring contemporaneous with JWST observations. Initially, we applied this methodology to GJ 1214 using data from various facilities, including CARMENES, SNO, MuSCAT-2 and TJO. We utilised the StarSim tool to determine the properties of active regions on GJ 1214 and simulate the effects of stellar activity on transmission spectra. We also trained neural network models to predict the stellar activity corrections for transit spectroscopy based on the input contemporaneous monitoring data. Our models provided corrections with a scatter under 100 parts per million (ppm) in transit depth.

Our work establishes a robust framework for mitigating stellar activity in future JWST observations and missions like Ariel, paving the way for more precise and reliable exoplanet atmospheric studies. Building on these promising results, we will apply our methodology to other targets of interest, including TRAPPIST-1, for which we have already gathered data (CARMENES, MuSCAT-2, TJO, Danish 1.54 m Telescope) contemporaneous with JWST observations and conducted preliminary analyses.

Poster

No

Primary author: PORQUERAS LEÓN, Òscar (IEEC/ICE-CSIC)

Presenter: PORQUERAS LEÓN, Òscar (IEEC/ICE-CSIC)

Session Classification: Morning talks

Track Classification: Talks

Contribution ID: **59** Type: **Abstract**

Black holes: funnels or droplets?

Friday 4 October 2024 12:40 (10 minutes)

Holography is a field of theoretical physics that explores the nature of quantum gravity. Through the AdS/CFT duality, physicists can solve complicated computations of gauge theories inhabiting a "boundary" by working with gravity theories in one more dimension, the so-called bulk. The duality dictates an equivalence between objects on each of its two sides, like a dictionary. What happens if we put a black hole on the boundary? What body inhabits the hyperbolic space in this case, and what shape does it have? Can this situation be studied dynamically? And most importantly, do we have a black funnel, a black droplet, or have we broken physics?

Poster

No

Primary authors: Dr SERANTES, Alexandre; Prof. MATEOS, David; SOLÉ VILARÓ, Pau

Presenter: SOLÉ VILARÓ, Pau

Session Classification: Morning talks

Track Classification: Talks

Contribution ID: **60** Type: **Abstract**

Taming assembly bias for primordial non-Gaussianity

Friday 4 October 2024 11:20 (10 minutes)

In the standard scenario, single-field slow-roll inflation provides a mechanism to seed primordial density perturbations, distributed as a Gaussian, which evolve during the expansion history of the Universe to eventually form its observable structure. Alternative inflationary models, however, can produce amounts of primordial non-Gaussianity (PNG) which detection would rule out the standard inflationary model, giving insights on the physics of the primordial Universe.
The observations of cosmic microwave background (CMB) anisotropies and the distribution of galaxies in the large-scale structure (LSS) represent two independent ways to probe the physics of the inflationary epoch. In particular, LSS measurements from galaxy clustering are currently weaker, but are expected to improve significantly with ongoing galaxy surveys.

Local type PNG induces a strong scale-dependent bias on the clustering of dark matter halos in the late-time Universe. This effect can be exploited to constrain the value of the non-Gaussianity parameter f_{NL} from LSS observables. However, the perfect degeneracy between f_{NL} and the bias parameter b_ϕ, which drives the amplitude of the signal, prevents the ability to constrain f_{NL} in the absence of an informative prior on b_ϕ. In particular, it is well-known that assembly bias, which is due to the formation history of halos, provides a strong contribution to the value of b_ϕ.
In the talk, it is shown how assembly bias can be modeled and constrained, improving the power of galaxy surveys to competitively constrain local primordial non-Gaussianity. In particular, by reporting the results on the analysis on hydrodynamical simulations, it is shown that a proxy for the halo properties that determine assembly bias can be constructed from photometric properties of galaxies. Using a prior on the assembly bias guided by this proxy degrades the statistical errors on f_{NL} only mildly compared to an ideal case where the assembly bias is perfectly known.

Poster

No

Primary author: FONDI, Emanuele (ICCUB)

Presenter: FONDI, Emanuele (ICCUB)

Session Classification: Morning talks

Track Classification: Talks

Contribution ID: **61** Type: **Abstract**

Where are the Planets? Mitigating Stellar Activity in Radial Velocity data using Machine Learning Techniques.

Friday 4 October 2024 10:20 (10 minutes)

Exoplanet studies have shown us that most stars host in average planetary systems. Very few of these exoplanets have been directly observed. We rely mostly on indirect methods such as the radial velocity (RV) technique. This technique relies on detecting exoplanets by analyzing the Doppler signals induced on the stellar spectra due to an orbiting planet. However, RVs are not only sensitive to planetary companions, but also to stellar phenomena such as spots, facula or granulation, which can mimic and hide planetary signals. The current generation of spectrographs have been designed to have precisions below 1 m/s, even 10 cm/s for ESPRESSO. Despite this extreme precision, stellar activity raises the noise floor of our observations to a few m/s, not allowing us to detect a true Earth twin, which would induce a Doppler signal as low as 9 cm/s. For two decades now, the community has struggled with this problem and Machine Learning (ML) can help to solve it. ML has been proven to be very good at building models based on a set of training examples. These methods are now seeing their first implementations across the exoplanet field, yielding remarkable success in various applications (Beurs et al., 2022; Perger et al., 2023; Liang et al., 2024, Zhao et al., 2024).

With this talk, I aim to introduce the RV technique and how it is limited by stellar activity. Then, I will present how we aim to solve this problem using ML techniques. The main focus of the talk is showing which inputs we have found to possess the most stellar activity content, so we can get the best correction on our RV observations. Additionally, I will showcase the application of this method to highly active stars observed with the HARPS-N and CARMENES spectrographs.

Poster

No

Primary author: BLANCO POZO, Jordi (Institut de Ciències de l'Espai (ICE-CSIC))

Presenter: BLANCO POZO, Jordi (Institut de Ciències de l'Espai (ICE-CSIC))

Session Classification: Morning talks

Track Classification: Talks

Contribution ID: **62** Type: **not specified**

Phase diagram of near-extremal geometries in five dimensions

Friday 4 October 2024 11:00 (10 minutes)

Classical GR in five dimensions is richer than our usual four dimensional universe in terms of geometries with horizons and singularities, i.e. “black stuff”. Here we aim to study two of those geometries and try to establish how they both converge to a common “critical geometry” in a specific extremal regime, bringing a picture equivalent to a phase diagram of black geometries in five dimensional spacetimes.

Poster

Presenter: RAFECAS, Jordi

Session Classification: Morning talks