First name: Teresa
Last name: Antoja
Email Address: tantoja@fqa.ub.edu
Affiliation: Institut de Ciències del Cosmos, Universitat de Barcelona
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Shedding light upon our Galaxy and its past with Gaia'
Abstract: 'As promised, the excellent precision and large amount of data delivered by the Gaia satellite have allowed us to progress outstandingly on the studies of our Galaxy during this first year of scientific harvest after the Data Release 2. In this talk I will review the discoveries that are redefining our Galaxy and its past focusing on two fronts: Galactic Archaeology and dynamics of the Milky Way disk.'

First name: Betsey
Last name: Adams
Email Address: adams@astron.nl
Affiliation: ASTRON
Position: Staff
Presentation request:
Type: Talk
Title: 'Apertif imaging surveys'
Abstract: 'Apertif is a new phased-array feed for the Westerbork Synthesis Radio Telescope (WSRT), significantly increasing its field of view and turning it into a survey instrument. Two tiers of imaging surveys will be undertaken with Apertif, a shallow and medium deep survey, providing HI, radio continuum and polarization data products. Apertif recently completed a science evaluation period, demonstrating the capabilities of this facility. I will summarize the results of this period and discuss the outlook for the Apertif imaging surveys. Highlights include continuum images produced over 300 MHz of bandwidth and multiple blind HI detections.'

First name: Kyle
Last name: Oman
Email Address: koman@astro.rug.nl
Affiliation: Kapteyn Institute
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Quenching & stripping of cluster satellites via phase-space matching to simulated orbits'
Abstract: 'We use N-body simulations to infer the probability distribution of orbits of galaxies in clusters from their spatial and kinematic coordinates. We propose a simple model of environmental star formation suppression which we fit to a large sample of SDSS cluster member candidates to infer the quenching delay time, timescale, and efficiency in clusters. We find that cluster satellites are quenched rapidly, with ~100% efficiency, within approximately 1Gyr of their first pericentric passage. We repeat a similar exercise with a sample surveyed in 21cm emission the Coma cluster to assess the orbital dependency of neutral hydrogen stripping; results are forthcoming.'

First name: Gabriella
Last name: Di Gennaro
Email Address: digennaro@strw.leidenuniv.nl
Affiliation: Leiden Observatory
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Exploring particle (re-)acceleration in merging galaxy clusters'
Abstract: 'Galaxy clusters form by accretion of gas and by mergers with other clusters and galaxy groups. They reveal their presence by means of diffuse radio emission (i.e. relics and halos) and disturbed X-ray morphologies. Despite recent progress in our understanding of these sources, there are still many open questions regarding the underlying particle acceleration mechanisms, magnetic field properties and evolution with redshift. New low-frequency radio telescopes, such as LOFAR, in combination with deep imaging at GHz frequencies and high-energy observations with X-ray satellites, can provide important constraints on models for the formation of relics and halos. Here we present the case of the merging system ZwCl0008.8+5215, which displays an interesting case of puzzling particle (re-)acceleration scenario. We also present the results of the first detection of pieces of diffuse emission at high redshift with LOFAR.'

First name: Kenzie
Last name: Nimmo
Email Address: k.nimmo@uva.nl
Affiliation: ASTRON/UvA
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Resolving a Decades-Long Transient with Potential Links to FRBs'
Abstract: 'Ofek (2017) identified FIRST J141918.9+394036 (hereafter FIRST J1419+3940) as a radio source sharing similar properties and host galaxy type to the compact, persistent radio source associated with the first known repeating fast radio burst, FRB 121102. Law et al. (2018) showed that FIRST J1419+3940 is a transient source decaying in brightness over the last few decades. The possible interpretation of the origin of the emission is either a magnetar wind nebula or an orphan afterglow of a long gamma-ray burst. In this talk I will present our recent detection of FIRST J1419+3940 using the European VLBI Network at 1.6 GHz, and discuss its implication on the origin of the emission. Since the discovery of FIRST J1419+3940 was motivated by observations of FRB 121102, it is natural to search FIRST J1419+3940 for millisecond-duration radio bursts. I will talk about our single pulse search on high-time-resolution Effelsberg and Green Bank Telescope data targeting FIRST J1419+3940.'

First name: Violeta
Last name: Gámez Rosas
Email Address: gamez@strw.leidenuniv.nl
Affiliation: Leiden University
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Resolving the secrets of AGNs with MATISSE'
Abstract: 'Interferometry in the mid infrared benefits from several advantages for the study of the cores of AGNs, namely optimum access to the innermost dusty regions that lie very close to the central blackhole and a much higher resolution compared to single dish telescopes. Already with MIDI the old model of the dusty toroidal structure was challenged by unveiling substantial extended IR emission in the most unexpected directions. MATISSE, the latest instrumentation in this field, expands the reach of MIDI further into and beyond the mid-IR to the L and M bands, adds more spectroscopic potential and aims at fully exploiting multiple-baseline interferometry with the VLTI allowing, for the first time, image reconstruction. This talk describes MATISSE and the first results from the commissioning data.'

First name: Matus
Last name: Rybak
Email Address: matus.rybak@gmail.com
Affiliation: Leiden Observatory
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Beyond blobs: dissecting extreme, dusty starbursts on (k)pc-scales'
Abstract: 'Sub-millimeter galaxies (SMGs) play a key role in the epoch of the peak star-forming activity of the Universe and are an important laboratory for understanding intense star formation. However, our understanding of these extreme sources -- what drives their intense star-formation? what are the physical properties of their star-forming ISM? - has been long limited to considering only source-averaged properties.
However, inferring gas and dust properties from source-averaged quantities - the best we could do for unresolved blobs - can lead to a significantly (>1 dex) biased results, as different tracers (dust, CO, C+, etc.) can have very different spatial distribution.
I will present recent results from resolved multi-tracer studies of dust and gas in z>2 SMGs at (k)pc resolution. Combining the superb angular resolution and high-frequency capabilities of ALMA, gravitational lensing and radiative transfer modelling, our results provide an unprecedented view of the conditions in these extreme star factories.'

First name: Michiel
Last name: Min
Email Address: M.Min@sron.nl
Affiliation: SRON
Position: Staff
Presentation request:
Type: Talk
Title: 'Advances in understanding (exo)planetary systems and their formation'
Abstract: 'Understanding the formation of planetary systems is key in answering the question of our own origin, and how unique the Solar System is. Studying planet formation can be done by looking at the first stages of formation (the protoplanetary disks) the early stages of a system (the debris disk phase) or by studying the final outcome (the planets themselves). Bringing these studies together is an extremely rapidly growing field of research. One of the important topics in studies of exoplanet atmospheres is, for example, to try to link the composition of the atmosphere to the formation conditions. But also statistical properties of planetary systems are linked to their formation through planet population synthesis models, where the entire formation process is followed. I will discuss the state of the field linking observational properties of disks and planets through theoretical models. Also, I will discuss our future plans with telescopes from the ground and space missions like JWST, PLATO and ARIEL.'

First name: Nika
Last name: Jurlin
Email Address: jurlin@astro.rug.nl
Affiliation: Kapteyn Institute / ASTRON
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Restarting phase of the life-cycle of radio galaxies'
Abstract: 'Supermassive black holes at the centre of galaxies can cycle through periods of activity (in this phase known as active galactic nuclei, AGN) and quiescence.
Quantifying the duty cycle of AGN is crucial for understanding the energetic impact they have on the host galaxy. In radio AGN this duty cycle can be investigated by using the characteristics of the radio spectrum and the morphology of the radio emission. The low radio frequencies can be used as fossil record to trace the oldest populations of particles.
Using deep LOFAR images of the Lockman Hole extragalactic field we have identified candidate restarted radio sources selected using criteria based on the core prominence and the spectral index. We studied radio properties of these objects and we derived their rate of occurrence, which provides fundamental information for understanding the duty cycle of radio sources.
Thanks to optical and IR ancillary data, we could derive the optical properties of their host galaxy. We were able to compare these radio and optical properties with those of a comparison sample and a sample of candidate remnant radio sources that we have selected in the same field.
The results will also be discussed in the context of models of the evolution of the radio sources that we have developed in order to obtain broader understanding of the life-cycle of radio galaxies.
The methods for the identification of restarted radio sources and optical identification of both remnant and restarted radio sources developed for this project will soon be applied for selecting larger samples in the LOFAR Two-metre Sky Survey.'

First name: Leon
Last name: Oostrum
Email Address: oostrum@astron.nl
Affiliation: ASTRON / UvA
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Repeating Fast Radio Bursts with WSRT/Apertif'
Abstract: 'The Apertif upgrade has transformed the Westerbork Synthesis Radio Telesope (WSRT) into a highly efficient survey instrument. The Apertif-Lofar Exploration of the Radio Transient sky (ALERT) survey is on-sky as of 2019, searching in real-time for Fast Radio Bursts (FRBs). These are extermely bright, millisecond duration radio bursts of unknown origin.
Two FRB sources are known to repeat: FRB 121102, and R2. So far, only FRB 121102 has been localized to a dwarf galaxy at a redshift of z = 0.2, posing challenging energy requirements on models of FRB emission. As part of the commissioning of ALERT, we observed these two repeating FRB sources for several tens of hours. Multiple bursts were detected from FRB 121102, whereas R2 was not detected.
I will discuss the bursts from FRB 121102, inferences on the activity of both sources, and the implications for the rate of FRBs detectable by ALERT.

First name: Gabriel
Last name: Caminha
Email Address: caminha@astro.rug.nl
Affiliation: Kapteyn Astronomical Institute - University of Groningen
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Using gravitational telescopes to probe the faint and distant Universe - a preparation for JWST'
Abstract: 'Strong gravitational lensing by galaxy clusters can magnify the light of background sources by factors of tens or more, pushing the current observational limits towards the faint and distant Universe.
Thanks to coordinated programs using deep HST imaging (from large programmes such as CLASH, Hubble Frontier Fields and RELICS) and spectroscopy from MUSE and VIMOS (with CLASH-VLT) in cluster fields, we can now probe intrinsically faint, high redshift (out to z ~ 6.6) sources in detail with potential impact on cosmic reionization.
It is worth noting that some of these clusters have been selected to be observed with JWST under different GTO and ERS programmes (IDs 1176, 1199, 1208, and 1324).
In this talk I will show the current deep MUSE data from our ESO/VLT programmes on a sample of clusters and the characterization in the rest-frame UV of intrinsically faint Lyman-alpha emitters (with ly-alpha luminosities down to ~10^{41} erg/s) at high redshifts, that can be observed only thanks to the gravitational lensing effect.
This will give us a glimpse and help to pave the way for the science that we will be able to explore with JWST and the extremely large telescopes in the near future.'

First name: Joris
Last name: Kersten
Email Address: kerstenjoris@gmail.com
Affiliation: Radboud University
Position: MsStudent
Presentation request:
Type: Talk
Title: 'Modeling the gravitational waves of eccentric orbit binary systems'
Abstract: 'Gravitational waves from black hole binaries have been detected by the LIGO/VIRGO collaboration. Many more detections are expected in the future, also by other detectors that have yet to be built. The binaries that have been detected thus far followed a circular orbit. But there are situations in which an eccentric orbit can occur. To detect such events accurate theoretical waveforms are needed. In this talk I will discuss my efforts to create such waveforms in the Effective-One-Body framework. This framework makes it possible to create complete waveforms, from inspiral to ringdown, and it is used for circular waveforms by LIGO/VIRGO.'

First name: Koushik
Last name: Chatterjee
Email Address: k.chatterjee@uva.nl
Affiliation: University of Amsterdam
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'The first very high resolution studies of the magnetic field driven acceleration in large scale relativistic jets'
Abstract: 'Astrophysical jets are some of the most diverse laboratories of the known physical universe due to the interplay between the central compact object, matter and electromagnetic fields. Jets are also structurally stable over large distances, invoking the need for large-scale magnetic fields to support the outflow against the ambient medium. From general relativistic simulations of black hole-thick accretion disc systems using the new state of the art GPU GRMHD code H-AMR, we can now study the acceleration of these outflows, in relation to their collimation, out to 5 orders of magnitude in both spatial and temporal evolution while resolving the tiny scales of the pinch instability by going up to more than 4 million cells in resolution. The energetics associated with these systems largely consist of the conversion of magnetic to kinetic energy combined with flow instabilities and shocks, which may be responsible for the radiation output. I will talk about the nature of these outflows with varying properties, such as their asymptotic Lorentz factor, in the context of recent long term VLBI AGN observations of the sub-kilo parsec scale jet in the M87 galaxy.'

First name: Jakub
Last name: Klencki
Email Address: j.klencki@astro.ru.nl
Affiliation: Radboud University
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Nuclear-timescale mass transfer from evolved supergiants at subsolar metallicity'
Abstract: 'Massive stars are almost exclusively formed in binary systems. Over the course of their evolution, most of them are going to interact with companions in mass transfer events. It is generally believed that if the donor star is a massive evolved supergiant then the mass transfer will proceed on a fast thermal timescale and the donor will become stripped of its envelope in less then 10 thousand years. Using detailed stellar evolution calculations, we show that this is not the case in subsolar metallicity environments, such as the Small Magellanic Cloud (SMC). I will discuss how the different structure of core-helium burning blue supergiants at the SMC metallicity allows for a much longer, nuclear-timescale mass transfer phase lasting up to 1 million years, with the typical mass transfer rates of the order of 1e-5 Msun/yr. In the case of black hole accretors, this implies a super-Eddington mass transfer phase with a duration that is about 100 times longer then what is possible
in solar metallicity environments. I will showcase the possible implications of our findings in the context of donor stars in high-mass X-ray binaries, ultra-luminous X-ray sources, and compact binary mergers. '

First name: Anna
Last name: Bilous
Email Address: hanna.bilous@gmail.com
Affiliation: UvA
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Revisiting the fractional amplitudes of type I thermonuclear burst oscillations in the RXTE legacy dataset'
Abstract: 'Type I thermonuclear X-ray bursts in the low-mass X-ray binaries occur when material accreted from the companion explodes on the surface of a neutron star. For the reasons not entirely understood about 10% of such bursts develop asymmetric brightness patches, which are further observed as modulations of X-ray flux with (approximately) the spin period of a neutron star. These modulations, called burst oscillations, are the unique tools for exploring the nuclear burning in the strong gravity/magnetic fields on the neutron star surface, as well as for probing the state of matter under the most extreme conditions inside the star itself. Thus, describing properties of burst oscillations (in particular, the evolution of oscillation frequency within the burst) is very important.

So far, the majority of burst oscillation studies have been performed on the bulk of the observations coming from the Rossi X-ray Timing Explorer (RXTE). In our work we re-analyze the archival RXTE data and perform a uniform search for burst oscillations from almost all type I X-ray bursts observed by RXTE. We apply traditional Fourier analysis technique, but rely on more realistic noise models, based on the simulation of photon arrival times for each burst. The simulations take into account the light curve shape, data gaps and dead time influence. For the detections, we compute the fractional amplitudes of oscillations and place the upper limits on the factional amplitudes of non-detections. Finally, we compare our findings to the previous works.'

First name: Glenn-Michael
Last name: Oomen
Email Address: glennmichael.oomen@kuleuven.be
Affiliation: KU Leuven/Radboud University
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Modelling depletion in post-AGB stars by re-accretion of gas from a dusty disc'
Abstract: 'Post-asymptotic giant branch (post-AGB) stars are transition objects between the AGB and planetary nebula (PN) evolutionary phases. Many post-AGB stars are chemically peculiar, showing underabundances of refractory elements in their photospheres that scale with condensation temperature. This phenomenon, also called depletion, is expected to be the result of accretion of gas from a dusty disc, since only post-AGB stars with a circumbinary disc present in the system are depleted. Most refractory elements in the disc are condensed into dust grains, which do not get accreted since they experience a strong radiation pressure. The composition of the accreted gas therefore lacks refractory elements, such that the photosphere of the post-AGB star can be diluted to create the chemical peculiarity that is observed.
In this contribution, we provide the first models of the onset of depletion in post-AGB stars using the advanced stellar evolution code MESA. These models are compared to a sample of 58 observed disc-type post-AGB stars in our Galaxy with chemical abundance data. We find that large initial accretion rates (≳3*10-7 M⊙/yr) and large initial disc masses (∼10-2 M⊙) best reproduce the observed depleted post-AGB stars. These high accretion rates can have a strong effect on the evolution of the star, as the evolution timescale of post-AGB stars can be significantly extended by factor 2 5. Furthermore, because of the slow evolution of the lower-mass post-red giant branch (post-RGB) stars, we find that these systems can become depleted at lower effective temperatures (<5000 K). We conclude that accretion from a circumbinary disc successfully accounts for the chemical peculiarity of post-AGB stars.

First name: Hyoyin
Last name: Gan
Email Address: hgan@astro.rug.nl
Affiliation: Kapteyn Astronomical Institute
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Analysing time dependence of noise in LOFAR-EoR power spectra.'
Abstract: 'LOFAR (Low Frequency ARray) is a new generation radio interferometer covering the unexplored low-frequency range from 10 to 240 MHz. Among its key science projects, LOFAR-EoR (Epoch of Reionisation) is set to detect the spectral fluctuations of the redshifted neutral hydrogen (HI) 21-cm signal. The main challenge is that the 21-cm signal is contaminated by the strong foreground galactic emission and extragalactic sources, ionospheric and instrumental effects. These effects can be largely mitigated by calibration and applying foreground removal techniques, such as Gaussian Process Regression (GPR). To further understand the nature of noise in the power spectra, we performed a jackknife test on 13 nights of LOFAR-EoR data by slicing its observation time. We focus on analysing the time dependence of noise in the EoR power spectra and on finding a correlation between the slices.'

First name: Smaran
Last name: Deshmukh
Email Address: s.deshmukh@rug.nl
Affiliation: Kapteyn Astronomical Institute
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Properties of dust-obscured Spitzer-selected sources at z > 6'
Abstract: 'We investigate the properties of >130 Spitzer-selected galaxies at z > 6. We use the deepest Spitzer imaging in the COSMOS field from the SMUVS survey to constrain the stellar mass and dust-obscuration of these objects. We particularly study the number density of dusty sources at different high redshifts, in order to track their evolution after reionisation. We find that the number density of these objects drops sharply with increasing redshift. We compare our results with existing theoretical models and discuss their implications.'

First name: Nicolas
Last name: Moens
Email Address: nicolas.moens@kuleuven.be
Affiliation: KuLeuven
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Radiation hydrodynamics in massive stars'
Abstract: 'In massive stars radiation is a critical factor regarding the dynamics of the stellar gas. In the deep atmospheres as well as in the supersonic wind outflows, the acceleration due to radiation is on par with or even greater than the acceleration due to gravity. This impacts the structure of star itself, controls how much mass is lost from its surface, and regulates the overall evolution of the massive star. In particular, the radiation-dominated envelopes of the most massive stars in our Universe are expected to very unstable and experience giant, eruptive phases of mass-loss, ultimately determining also the properties of the compact object left behind after the star finally goes supernova. To understand the roles of radiation and convective structure formation in driving such eruptive mass loss, it is necessary to model the stellar envelope time-dependently in multiple dimensions, accounting for the time-dependent radiation field. Here, we present a first step towards und
erstanding the effects of radiation on atmospheric dynamics and eruptive mass loss, by means of development of a general purpose radiation-hydrodynamics computer code using the so-called flux-limited diffusion approximation.'

First name: Maria Cristina
Last name: Fortuna
Email Address: fortuna@strw.leidenuniv.nl
Affiliation: Leiden Observatory
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Contamination from the intrinsic alignment in cosmic shear analyses: the role of satellite galaxies and the luminosity dependence of the signal'
Abstract: 'Galaxies form and live inside dark matter haloes, where they are continuously exposed to the gravitational interaction with the surrounding matter distribution. This induces a coherent alignment on physically near galaxies, called intrinsic alignment (IA). IA mimics the weak lensing signal, biasing the cosmological parameter estimation if not properly modelled and accounted for.
Motivated by recent observational works highlighting the role played by satellite galaxies in suppressing the IA signal at large and intermediate scales, we investigate how it propagates in a cosmic shear analysis. Flux limited surveys implicitly select the galaxy sample along the redshift baseline, with more luminous galaxies dominating the high redshift tale. This results in a redshift dependent modulation of the IA signal, as it is observed that luminous galaxies are more strongly aligned than the faint ones. In addition to that, the lack of satellites enforced by the magnitude cut boosts the signal, due to the lack of their suppressing contribution.
In this talk, I will present our current work on modelling the impact of satellite alignment and forecasting how the combined effect of a luminosity scaling and the satellite suppression can bias the cosmological parameter estimation. This will be crucial in the perspective of upcoming surveys such as Euclid and LSST.'

First name: Anne
Last name: Hutter
Email Address: a.k.hutter@rug.nl
Affiliation: Kapteyn Astronomical Institute, University of Groningen
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Shedding light on the sources of reionization'
Abstract: 'In the past few years high-redshift galaxy observations and simulations have significantly extended our knowledge on the nature of high-redshift galaxies. However, essential properties such as the escape fraction of ionizing photons from galaxies into the intergalactic medium and their dependency on galactic properties remain essentially unknown, but determine significantly the distribution and time evolution of the ionized regions during the epoch of reionization. Analysing this ionization topology by means of the neutral hydrogen sensitive 21cm signal with radio interferometers such as SKA offers a complementary and unique opportunity to determine the nature of these first galaxies.
I will show results from a new self-consistent semi-numerical model of galaxy evolution and reionization, and discuss the potential of inferring galactic properties with the 21cm signal by means of power- and/or bispectra as well as the impact of reionization on the high-redshift galaxy population and its evolution. '

First name: Vlad
Last name: Kondratiev
Email Address: vlad.kondratiev@gmail.com
Affiliation: ASTRON
Position: Staff
Presentation request:
Type: Talk
Title: 'Single pulses from LOFAR HBA census: inception'
Abstract: 'I am going to present first results of single-pulse studies of pulsars from LOFAR HBA census (Bilous, Kondratiev et al. 2016). This legacy census comprises of high-time-resolution full Stokes data for 158 pulsars above Dec=8 deg and Galactic latitude |Gb| > 3 deg, with many pulsars being almost unexplored at frequencies below 200 MHz. The average profiles together with measurements of dispersion measures and flux densities and spectra were presented in the aforementioned paper. The current work is focused on studying the low-frequency properties of individual pulses such as pulse-energy distribution and its frequency dependence, single pulse widths, phases of occurrence, nulls, drifting subpulses, moding, etc. Single-pulse phenomena reflect conditions in the pulsar magnetosphere, and thus could provide valuable clues to understanding the pulsar emission mechanism.'

First name: Giulio
Last name: Rosani
Email Address: g.rosani@rug.nl
Affiliation: Kapteyn Astronomical Institute
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Bright Lyman-alpha emitters among Spitzer SMUVS galaxies in the MUSE/COSMOS field'
Abstract: 'The study of high redshift galaxies provides an important constraint on the theory of their origin and on galaxy evolution models. It is thus essential to study such objects not only through high quality data, but with as little preconception as possible. The MUSE instrument mounted on the VLT provides exactly the type of observations needed to identify objects in the redshift range $2.9<z<6.7$ without pre-selection. We use MUSE spectroscopy to confirm the redshifts of Spitzer and UltraVISTA selected SMUVS galaxies in the COSMOS field. The Spitzer selection assures us we have the more massive objects in our field of view, while MUSE provides us with the detection of the more prominent, relatively unobscured star forming objects.
We take advantage of the physical properties provided by SMUVS through SED fitting, comparing the sample of MUSE detected SMUVS galaxies to the sample of SMUVS MUSE non-detection to test if the two populations are intrinsically different. We also performed a blind search in our MUSE cubes and enlarged our sample of Lyman alpha emitters by a factor of ~3. These sources were previously undetected in SMUVS or any other spectroscopic work in COSMOS. We the compared their luminosity to the luminosity of the SMUVS MUSE-detected galaxies. Furthermore, we identify potential galaxy associations in the MUSE covered area. This further highlights the capability of MUSE to detect unbiased Lyman alpha line emission, even without a continuum-detection, allowing for a greater ease in identifying high redshift objects and their potential neighbors.'

First name: Asger
Last name: Gronnow
Email Address: gronnow@astro.rug.nl
Affiliation: Kapteyn Institute
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Magnetised clouds in the Galactic corona: Fuel for future star formation?
'
Abstract: 'The Galactic halo contains a complex ecosystem of multiphase intermediate-velocity and high-velocity gas clouds whose origin has defied clear explanation. They are generally believed to be involved in a Galaxy-wide recycling process, either through an accretion flow or a large-scale fountain flow, or both. Recent numerical studies have found that they accrete gas efficiently from the hot corona as they move through it. In these models, gas stripped from the clouds mixes with the low density coronal gas significantly reducing its cooling time scale. The newly cooled gas follows the cloud to the disk where it is accreted and may fuel star formation. These studies, however, ignore the effects of the coronal magnetic field and are typically two-dimensional. In this talk, I will present our 3D high-resolution simulations where we find that the magnetic field significantly decreases the amount of mixing by damping instability along the cloud boundaries. This in turn suppresses t
he condensation in the wake of clouds significantly lowering the efficiency of fountain-driven accretion. These accretion rates are in better agreement with observational constraints compared to the excessive accretion seen in our non-magnetic simulations.'

First name: Luis Henry
Last name: Quiroga Nunez
Email Address: quiroganunez@strw.leidenuniv.nl
Affiliation: Leiden Observatory / JIVE
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Chasing the Galactic structure using VLBI and Gaia'
Abstract: 'The Bar and Spiral Structure Legacy (BeSSeL) survey and the Bulge Asymmetries and Dynamical Evolution (BAaDE) project target maser stellar emission from young massive stars and evolved stars, respectively. Follow-up radio-astrometric measurements are complementary to Gaia results since the inner plane of the Galaxy is obscured at optical wavelengths. We are constructing a cross- match sample between Gaia sources and BAaDE targets. This resulting sample provides important clues on the intrinsic properties and population distribution of evolved stars in the Galactic plane, but especially at the Galactic Bulge. For the BeSSeL targets, which are heavily obscured, we are investigating whether they can be associated with clusters of massive young stars detectable at optical wavelengths, and how such can contribute to improving the accuracy of the fundamental Galactic parameters and the Galactic spiral structure distribution. '

First name: Alessandro
Last name: Savino
Email Address: A.savino@rug.nl
Affiliation: Kapteyn Institute
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Resolving the early phases of dwarf galaxy formation with helium-burning stars'
Abstract: 'Resolved stellar populations provide an excellent tool to get a detailed picture of star formation in nearby dwarf galaxies, back to the oldest times. However, a precise determination of very old stellar ages is still hampered by theoretical and observational limitations. I will describe a new modelling approach that, for the first time, combines classical colour-magnitude diagram analysis with horizontal branch modelling, allowing to measure the star formation history of resolved galaxies with greater precision and detail than previously done. The combined modelling of many features on the colour-magnitude diagram breaks many of the degeneracies that affect the morphology of the horizontal branch, and permits to obtain solid measurements of the red giant branch mass loss. I will present the results of this modelling on Local Group dwarf spheroidal galaxies, uncovering more complex ancient star formation histories than previously thought. I will discuss the potential of th is new method to extend our knowledge of ancient stellar populations to neighbouring galaxy groups, within several Mpc, providing a meaningful comparison with theoretical predictions over a cosmological representative volume.

First name: Aleksandar
Last name: Shulevski
Title: Early science with the AARTFAAC-12 radio transient all-sky monitor

AARTFAAC-12 is a sub-system of the LOFAR telescope which can correlate the voltages of individual receiving elements (dipoles) from the twelve most centrally located LOFAR stations. The resulting visibilities can be used to create a fish-eye view of the whole sky in the low-band frequencies of LOFAR (20 - 80 MHz) down to an elevation of 20 degrees, with an imaging cadence of up to one second.

A12 has completed its commissioning and is producing science-worthy data. With resolution of 10-15 arc-minutes and image noise of 0.5 Jy, it offers a variety of science applications. In this talk, I will present some of its initial commissioning results.

First name: Sophie
Last name: van Mierlo
Email Address: mierlo@astro.rug.nl
Affiliation: Kapteyn Astronomical Institute
Position: MsStudent
Presentation request:
Type: Talk
Title: 'Investigating the evolution of passive and star forming galaxies at 2 < z < 6 in the Spitzer Matching survey of the UltraVISTA ultra-deep Stripes (SMUVS)'
Abstract: 'We investigate the evolution of the spectral energy distribution (SED) properties of passive and star forming galaxies at 2 < z < 6 in the Spitzer Matching survey of the UltraVISTA ultra-deep Stripes (SMUVS). The SMUVS galaxy sample is complete down to stellar masses log10(Mst)=9.7 up to the highest redshifts. We mass-match the star forming and passive galaxies in order to compare them. We divide the star forming galaxies in dusty and non-dusty based on dust extinction E(B-V). By stacking the modeled spectra to create average spectra for the intermediate and high mass bins, we determine the flux ratio evolution of passive and star forming galaxies with redshift and investigate various properties such as age and star formation history. The research aims to investigate which SED properties of passive galaxies are significantly different from those of other galaxies with similar stellar masses at similar redshifts and to inspect whether there is any evolution in the typical S
EDs of passive galaxies from z=6 to z=2.'

First name: Tirna
Last name: Deb
Email Address: deb@astro.rug.nl
Affiliation: Kapteyn Astronomical Institute
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Neutral hydrogen gas in a striking jellyfish galaxy'
Abstract: 'Jellyfish galaxies have tentacles of material that stretch tens of kpc beyond their disks. These tentacles show signatures of ram-pressure stripping that happens when the hot, dense and powerful ICM pressure blows the gas out of the gravitational potential of the galaxies and create tail-like structures out of the disk, stimulating star formation within them. The GASP (GAs Stripping Phenomena in galaxies) survey is carried out with the MUSE Integral Field spectrograph on the VLT to observe over 100 of these galaxies over a wide range of masses, morphological asymmetries and environments. Five of the most striking jellyfish galaxies are observed with the VLA-C array. JO204 is one such spectacular jellyfish galaxy in the relatively low-mass cluster A957 that shows a tail of ionized gas extending up to 30 kpc. From APEX data, we found a lot of molecular gas in the disk and in the ionized gas tail. I present the VLA HI data that provides missing information about the neutral
gas phase. From the VLA observation of JO204, the HI content of this galaxy and the interplay between various gas phases is studied in detail. The HI tail is much more extended than the ionized gas tail and its unilateral extension is a distinct signature of ram-pressure stripping. We have also detected HI in absorption for the first time in this jellyfish galaxy against the 11 mJy central continuum source, which is an AGN. The red-shifted absorption profile of JO204 suggests that ram-pressure is pushing the HI gas towards the central black hole and thus triggering the AGN activity. '

First name: Raffaella
Last name: Morganti
Email Address: morganti@astron.nl
Affiliation: ASTRON and Kapteyn Institute (NL)
Position: Staff
Presentation request:
Type: Talk
Title: 'Molecular outflows in young radio AGN'
Abstract: 'AGN-driven gas outflows are thought to play an important role in the evolution of galaxies, through their impact on the evolution of star formation in galaxies as well as on the growth on the central supermassive black hole of the host galaxy. Much of the detailed physics of these gas outflows, what drives them, and their actual impact on the host galaxy, is still not well understood. We will present the results from recent ALMA observations of the nearby quasar PKS 1549-79. This object is one of the closest (z = 0.1525) examples of a young, radio-loud quasar where the AGN appears to be in the process of clearing the gas-rich surroundings in which it is enshrouded as the result from a recent merger. We detect a large reservoir of molecular gas (~10^10 Msol) in PKS 1549-79. Most of the gas is in the form of large tidal tails, but we also see the formation of a circum-nuclear disk of a few hundred pc in size. In the very centre of PKS 1549-79 we detect a very fast, massive outflow of molecular gas driven by the AGN. Our observations clearly reveal the effect of the AGN on the ISM. While on kpc scales the observed line ratios suggest that the conditions in the ISM are normal, in the inner few hundred parsec they show that the conditions in the circum-nuclear disk are clearly affected by the AGN. We also present the results from detailed numerical simulations of a yo
ung radio jet moving through a clumpy ISM. Comparing these simulations with the observations allows us to build a 3D picture of the AGN-ISM interaction in PKS 1549-79. In addition, we compare the results on PKS 1549-79 with those obtained on the molecular outflow we earlier detected in the much less powerful Seyfert galaxy IC 5063. This comparison shows that some aspects of the jet-ISM interaction are very similar (e.g. line ratios), but there are also important differences. Interestingly, the physical extent of the region with fast outflowing gas is much smaller in the more powerful PKS 1549-79. This is consistent with the predictions from the simulations.

First name: Yogesh
Last name: Maan
Email Address: maan@astron.nl
Affiliation: ASTRON
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Probing multi-frequency imprints of pulsar emission models'
Abstract: 'A large fraction of pulsars exhibit a variety of interesting phenomena in their single pulse sequences. One such phenomenon, called subpulse-drifting, has been regarded as one of the most insightful and intriguing aspects of pulsar radio emission. This phenomenon is generally explained by the presence of a number of emission sub-beams anchored to a carousel of sparks near the pulsar surface that rotates around the magnetic axis. While there have been extensive single pulse studies, geometric signatures of the underlying carousel, or lack thereof, in simultaneous multi-frequency observations have remained largely unexplored. I will present conceptual as well as mathematical formulation of such expected signatures, particularly that of a geometry induced phase-offset in subpulse modulation, which can be readily applied to observations. It will also be shown that the geometry induced phase-offset enables critical tests of various observed phenomena as well as proposed hypothe
ses, in addition to that of the carousel model itself. Some of these tests will be demonstrated using simulated as well as archival data from LOFAR and Arecibo telescopes, along with a discussion on exploiting wide-band or multi-frequency observations to scrutinize pulsar emission models using such methods.'

First name: Syeda Lammim
Last name: Ahad
Email Address: ahad@strw.leidenuniv.nl
Affiliation: Leiden Observatory
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Using Hydrangea suite simulations to connect observations of galaxy clusters over cosmic time'
Abstract: 'Galaxy clusters are excellent probes to study the effect of dense environment on galaxy formation and evolution. We compare the state-of-the-art observational data of massive galaxy clusters at different redshifts between 1.5 and 0 with data from the Hydrangea suite, a set of 24 cosmological hydrodynamic simulations of massive galaxy clusters. The distribution of stellar mass within clusters shows general agreement, but also small quantitative offsets. I will discuss how comparing normalised stellar mass functions in cluster and field environments provides insight about the average galaxy formation efficiency. Our results demonstrate that the simulation data can be used to connect observations from different redshifts, to study the physical processes that affect the cluster galaxies over cosmic time.'

First name: Andrzej
Last name: Szary
Email Address: szary@astron.nl
Affiliation: ASTRON
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Single pulse modelling and drifting subpulses of radio pulsars'
Abstract: 'In Szary \\& van Leeuwen (2017) we proposed a modification to the carousel model which follows from the insight that the discharging regions, i.e., sparks, do not rotate around the magnetic axis per se, but rather around the point of potential extremum at the polar cap. The model allows us to link the observed subpulse shift with the underlying spark motion, and hence explore conditions at the polar cap which are essential for plasma generation processes in the inner acceleration region. We developed a simulation which allows to generate single pulses for a given pulsar geometry and structure of surface magnetic field. The simulation was used to explain the highly unusual bi-drifting feature of PSR B1839-04. We found that A) the variation of global electric potential at the polar cap that leads to a solid-body-like rotation of spark forming regions is favourable, and B) the main parameter that affects the occurrence of bi-drifting is the impact factor divided by the openin
g angle ($\\beta / \\rho$), the lower the value, the more likely the bi-drifting is.'

First name: Yamila
Last name: Miguel
Email Address: ymiguel@strw.leidenuniv.nl
Affiliation: Leiden Observatory
Position: Staff
Presentation request:
Type: Talk
Title: 'Revealing the interior of Saturn with Cassini Grand Finale'
Abstract: 'The key to understand our origins is in the interiors of the giant planets. Their gaseous envelopes were accreted from the primordial protosolar nebula, containing crucial information for exploring the physics and the chemistry of the protosolar disk that gave birth to the solar system.
During the Grand Finale phase of Cassini mission, the spacecraft\'s orbit had a pericenter much closer to Saturn than before -between the planet and the rings- providing very accurate measurements of Saturns gravity field. Using this remarkable data, we were able to calculate new models to understand Saturn\'s interior structure and atmospheric dynamics, that have allowed us to find answers to some of the big mysteries in planetary science. In this talk I will show the models we use to understand Saturn\'s interior, the constrains we are obtaining regarding the amount and distribution of heavy elements and our latest results including a much deeper understanding of Saturns jet streams-, which has important implications for the atmospheric dynamics and to have a better map of the interior structure, composition and distribution of heavy elements in the planets interior.'

First name: Alessandro
Last name: Sonnenfeld
Email Address: sonnenfeld@strw.leidenuniv.nl
Affiliation: Leiden Observatory
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Accurate dark matter halo masses in the precision cosmology era'
Abstract: 'Dark matter plays a fundamental role in galaxy evolution, by setting the gas accretion rate and temperature in the early phases of galaxy formation and, later on, by determining the merger rate between galaxies.
However, determining the distribution of dark matter in the Universe is very challenging, limiting our ability to efficiently compare theoretical models with observations.
One of the best ways to obtain dark matter halo masses of galaxies is weak gravitational lensing.
Current and upcoming surveys such as KiDS and Euclid, in which Leiden Observatory is heavily involved, are providing weak lensing observations of unprecedented quality. In order to take full advantage of this wealth of data, however, accurate statistical analysis methods are required.
I recently developed a new method to infer the distribution of halo masses of a population of galaxies, based on a Bayesian hierarchical approach, which allows greater flexibility and accuracy compared to traditional weak lensing methods.
I will show examples of the application of this method to weak lensing data from the Hyper Suprime-Cam and KiDS surveys and discuss prospects for its use with data from Euclid.

First name: Matthew
Last name: Kenworthy
Email Address: kenworthy@strw.leidenuinv.nl
Affiliation: Leiden Observatory
Position: Staff
Presentation request:
Type: Talk
Title: 'The Hill Sphere transit of Beta Pictoris in 2017'
Abstract: 'We present the results from our international observing campaign to photometrically and spectroscopically monitor the transit of the Hill sphere of the gas giant exoplanet Beta Pictoris b, which occurred through 2017 and the start of 2018. Three large monitoring campaigns give almost 100% coverage of the 270 day transit, and spectroscopic measurements show dynamic material moving in the circumplanetary environment of the gas giant planet. We discuss our findings and their implications for planet and moon formation.'

First name: Pratik
Last name: Dabhade
Email Address: pratikdabhade13@gmail.com
Affiliation: Leiden University
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Giant radio galaxies in the LOFAR Two metre Sky Survey and its multiwavelength properties'
Abstract: 'Giant radio galaxies (GRGs) are a subclass of radio galaxies which have grown to megaparsec scales. GRGs are rarer than normal sized radio galaxies (≤ 0.7 Mpc) and the reason for their gigantic sizes is still debated. Here, we report the biggest sample of GRGs identified to date. These objects were found in the LOFAR Two-metre Sky Survey (LoTSS) first data release images, which cover a 424 deg2 region. Of the 240 GRGs found, 228 are new discoveries. The GRGs have sizes ranging from 0.7 to 3.5 Mpc and have redshifts between 0.1 and 2.3. Seven GRGs have sizes above 2 Mpc and one has a size of ∼ 3.5 Mpc. The sample contains 44 GRGs hosted by spectroscopically confirmed quasars. We also find that 21 GRGs are located in dense galaxy cluster/group environments, which were identified using optical data. Here, we present the search techniques employed and the resulting catalogue of the newly discovered large sample of GRGs. We explore its AGN optical and mid-infrared p
roperties, along with its star formation rate and black holmes, eddington ratio. These results will be presented in comparison to normal sized radio galaxies for the first time.'

First name: Kirsty
Last name: Butler
Email Address: butler@strw.leidenuniv.nl
Affiliation: Leiden Sterrewacht
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Molecular Outflows in High Redshift Dusty Galaxies'
Abstract: 'Outflows are crucially important for the gas budget and evolution of luminous star forming galaxies and AGNs, with observed mass outflow rates of the same order as the star formation rate. At the peak of the star formation/AGN era at z=2-4, such outflows must play a major role, but become extremely difficult to observe in CO lines. In ALMA Cycle 3, we carried out a very successful pilot project to test OH+ as a tracer of high-z outflows. OH+ is a sensitive outflow tracer in local IR-luminous galaxies, and lies close to CO(9-8) so that both lines are observed in one ALMA tuning. The OH+ line is detected in absorption, blueshifted with respect to the CO(9-8) which measures the bulk of the star forming gas. The outflow velocity can be measured pixel-by-pixel giving a detailed map of the outflow velocity field and column density. In this talk I present a case study of the gravitationally lensed galaxy H-ATLAS J085358.9+015537.'

First name: Leon
Last name: Houben
Email Address: l.houben@astron.ru.nl
Affiliation: RU - MPIfR
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Astrophysics Outreach at the Radboud University'
Abstract: 'A quick update and overview of all organised outreach events and developed programs in Nijmegen.'

First name: Selma
Last name: de Mink
Email Address: S.E.deMink@uva.nl
Affiliation: UvA
Position: Staff
Presentation request:
Type: Talk
Title: 'Harvesting Space Time Ripples for Stellar Astrophysics'
Abstract: 'Gravitational Waves searches are starting to reveal the properties of the emerging population of neutron stars and black holes. What do the detections teach us about the lives and deaths of their progenitors? What can we expect from the detections in the near future? I will highlight the main ideas that have been put forward to explain their formation, but also discuss the caveats and open questions. '

First name: Zack
Last name: Meyers
Email Address: holler@zackfrom.earth
Affiliation: University of Amsterdam
Position: MsStudent
Presentation request:
Type: Talk
Title: 'Transient Detection with LOFAR: A New Method'
Abstract: 'Surveys are an integral component of observational astrophysics, as high energy transient phenomena can give insight into extreme physics and the nature of our reality. Many transients emit via synchrotron or coherent radiation processes that are detectable in the radio domain. Discovering these sources, especially in the low frequency regime, has so far proven difficult. We present a new technique combining direction dependent deconvolution and sky model subtraction, resulting in one of the deepest radio transient surveys to date. Working with the LOFAR Two-metre Sky Survey (LoTSS), we have created and analyzed over 4000 images in one hour, two minute, and eight second cadences for each of the 63 fields in the HetDex Spring region. Our two minute snapshot images have an average RMS of 2 mJy, nearly approaching thermal noise. In addition to the methodology behind this new process, we present a list and analysis of new transient candidates utilizing machine learning techni ques. In the future, our pipeline will be expanded to Data Release 2 (DR2) as more sky is covered in the upcoming LoTSS observations. '

First name: Benito
Last name: Marcote
Email Address: marcote@jive.eu
Affiliation: Joint Institute for VLBI ERIC (JIVE)
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Resolving the decades-long transient FIRST J1419+3940: an orphan long gamma-ray burst or a young magnetar nebula?'
Abstract: 'The source FIRST J1419+3940 was recently discovered as a slow transient that has been fading for the last 30 years. The light-curve is consistent with an orphan long gamma-ray burst. However, our interest arises when comparing its host to the one where the Fast Radio Burst FRB 121102 is located: inside a low-metallicity star-forming region in a dwarf galaxy. Both sources show comparable compact radio emission and similar environments. We thus believe that FIRST J1419+3940 can be a potential host for FRBs. In this talk we present the results from observations conducted with the European VLBI Network (EVN) which allowed us to study the compactness of the source. These results allowed us to discard several scenarios for the fading source, and to establish comparisons with the persistent counterpart of FRB 121102.

First name: Turgay
Last name: Caglar
Email Address: caglar@strw.leidenuniv.nl
Affiliation: Leiden Observatory
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'The MBH - σ⋆ Relation of the Most Powerful Local Type 1 AGNs'
Abstract: ' In a volume limited complete sample of hard X-ray selected (14 - 195 keV), most luminous, local type 1 AGNs, referred as LLAMA , we examined the spatially resolved stellar kinematics and properties of the broad-line region (BLR). We aim to understand the BLR properties of the LLAMA AGN sample. As a by-product, we intend to test the robustness of the parameters, which are used for the AGN MBH - σ⋆ relation. Using data from ESO/VLT XSHOOTER, virial super-massive black hole masses (MBH) were derived from the BLR based dynamical scaling relations for Hα, Hβ and Paβ. The bulge stellar velocity dispersion (σ⋆) was determined from the Ca II triplet (CaT) absorption lines for each AGN. Single-epoch Broad Hα-line MBH masses of our sample were estimated in a range 6.19 ≤ log MBH ≤ 7.49 M⊙. We provide stellar velocity dispersion estimations from the CaT for LLAMA AGN sample, which results in a range of values 72 ≤ &#9
63;CaT ≤ 164 km s$^{−1}$. The resulting physical parameters are incorporated in the MBH - σ⋆ plane. The LLAMA AGN sample is found to lie below the MBH - σ⋆ relation of inactive galaxies with an offset of 0.60 dex. We conclude that our sample of AGNs can still be in an evolutionary phase of growth towards the MBH - σ⋆ relation. The offset from the MBH - σ⋆ relation can additionally be explained by two main phenomena: the majority of LLAMA AGN sample hosts pseudo-bulges and the emissions from the BLR and accretion disk weaken as a consequence of dust extinction, especially for Seyfert 1.8-1.9 galaxies. '

First name: Graziano
Last name: Ucci
Email Address: g.ucci@rug.nl
Affiliation: Kapteyn Astronomical Institute - University of Groningen
Position: PostDoc
Presentation request:
Type: Talk
Title: 'The Interstellar Medium of Galaxies: A Machine Learning Approach'
Abstract: 'Most of the information on the physical properties of galaxies is encoded in their spectra. These are characterized by a large number of emission lines from which their internal structure can be inferred. To this aim, a number of diagnostics using a small, pre-selected subset of emission line ratios have been used in the literature. I present a new method to reconstruct key physical properties of galaxies (metallicity, column density, ionization parameter, FUV flux and density) starting from a spatially resolved spectrum. This method exploits the full information encoded in all spectral lines detected by a given observation, including very faint ones. This is possible thanks to a combination of Supervised Machine Learning algorithms with a large synthetic spectra library.
The method is implemented in a numerical code publicly available called GAME (GAlaxy Machine learning for Emission lines) combining an Ensemble Machine Learning technique known as AdaBoost with Decision Trees as base learner. GAME has been extensively tested and shows to deliver excellent predictive performances when applied to synthetic spectra. GAME is, in fact, able to recover the ISM physical properties despite the large degeneracy affecting the emission line intensities. With JWST applications in mind, I show the first results obtained from the interpretation of IFU spectra of local galaxies.'

First name: Davide
Last name: Lena
Email Address: d.lena@sron.nl
Affiliation: SRON and Radboud University
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Hypercompact stellar clusters, and how to find them'
Abstract: 'More than a decade has gone by after the breakthrough in the simulation of merging black holes. The emerging picture is that these exotic objects will merge in a burst of gravitational waves (GWs). Differences in the mass and spin of the SMBH-binary will cause the GW-emission to be anisotropic, causing a net flux of linear momentum. As a result the newly formed black hole will recoil, and it will carry with it a retinue of bound stars: a hypercompact stellar cluster (HCSC). To date only a handful of candidates have been tentatively identified, with no secure detection. In this talk I will discuss our ongoing work on the search for HCSCs, the challenges, and the promises of ever growing public datasets. '

First name: Luka
Last name: Poniatowski
Email Address: luka.poniatowski@kuleuven.be
Affiliation: KU Leuven
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Winds of Wolf-Rayet stars '
Abstract: 'The dynamics and chemistry of galaxies like our own are largely controlled by the evolution of stars with masses many times that of the Sun. Such massive stars are key sources of heavy elements and UV radiation, and over their short but energetic lifespans they evolve to a stripped core that have lost their hydrogen-rich envelope. This end stage of massive stars evolution is called the classical Wolf-Rayet stage (WR). For a single star to evolve to this stage the initial mass they are born with should exceeded approximately 25 times the mass of the Sun, .
In general, such WR stars are characterised by strong, optically-thick wind outflows, which carry away an extreme amount of material (mass-loss rates:). These winds have an important feedback on the star, ultimately determining whether massive stars end their lives as neutron stars or black holes.
It is believed that these winds are driven by star-light and are initiated in sub-surface stellar, deep beneath the stellar photosphere. Currently the winds of WR stars are not well understood, and a consistent theory (such as for massive stars in their early evolution phase) is lacking. Without good theoretical constraints on the mass-loss rate, evolutionary models rely only on uncertain empirical scaling relations.
This project aims to investigate theoretically the problem of WR wind-driving, and so put important constraints on their mass-loss rates (e.g. as a function of stellar parameters Mass, Radius, Luminosity, Metallicity). Here we will present first some first results, highlighting a \"missing force\" problem when considering only the stellar opacities typically used in (static) evolution computations. We demonstrate a big dynamical impact from non-monotonic opacity variations, preventing any initiated outflow from escaping the stellar potential well. This suggests that an opacity treatment accounting properly for velocity-expansion effects is necessary not only to model the supersonic wind, but also to predict the deep-seated wind initiation and the associated mass-loss of classical Wolf-Rayet stars. '

First name: Dilovan
Last name: Serindag
Email Address: serindag@strw.leidenuniv.nl
Affiliation: Leiden Observatory / Leiden University
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Prospects for detecting extraterrestrial O2 with the ELTs'
Abstract: 'The future extremely large telescopes (ELTs) are expected to be powerful tools to probe the atmospheres of extrasolar planets using high-dispersion spectroscopy, with the potential to detect molecular oxygen in Earth-like planets transiting nearby late-type stars. So far, simulations have concentrated on the optical 7600 Angstrom A-band of oxygen using synthetic noise distributions. We build upon previous work to predict the detectability of molecular oxygen in nearby, temperate planets by using archival, time-series data of Proxima Centauri from the high-dispersion Ultraviolet and Visual Echelle Spectrograph (UVES) on ESO□s Very Large Telescope (VLT). The brightest transiting M-dwarfs are expected to be about 25 times fainter than Proxima, a factor that is similar to the difference in light-gathering power between the VLT and the future ELTs. By injecting synthetic oxygen transmission signals into the UVES data, the O2 detectability can be studied in the presence of real
data with real noise properties. We find that the molecular oxygen signature of an Earth-twin transiting a nearby M5V star can be detected in a few dozen transits.'

First name: Leonard
Last name: Burtscher
Email Address: burtscher@strw.leidenuniv.nl
Affiliation: Leiden University
Position: Staff
Presentation request:
Type: Talk
Title: 'A comparative study of stellar populations in the nuclei of ultra hard X-ray selected AGNs'
Abstract: 'The questions of AGN triggering and feedback are closely related, although it is frequently challenging to differentiate between them due to the lack of spatial resolution. To resolve this connection, we have observed a sample of luminous local AGNs with a matched sample of inactive galaxies (the LLAMA sample), using high spatial resolution integral field spectroscopy. With this exquisite data set, we will address the long standing question which connection (if any) there is between ongoing or recent nuclear star formation and AGN activity. Does it trigger AGN activity and does the AGN activity itself inhibit nuclear star formation?
To address these questions, we present the nuclear (Distance from the nucleus ca. 100 pc) star formation histories of the LLAMA sample. Using VLT/X-SHOOTER spectroscopy, we performed stellar population synthesis of ten AGNs and 17 inactive control galaxies. We find that the nuclear stellar populations of both AGNs and inactive, star-forming galaxies show a significant component of young (< 30 Myr) stars. Furthermore, the nuclear star formation histories of these two types of galaxies are similar and distinctly different from galaxies that are not currently forming stars. This suggests that galaxies hosting nuclear star formation are the parent sample of local powerful AGNs.'

First name: David
Last name: Gardenier
Email Address: davidgardenier@gmail.com
Affiliation: ASTRON | UvA
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Fast Radio Burst Population Synthesis'
Abstract: 'Despite first being detected a decade ago, fast radio bursts (FRBs) still elude our understanding in terms of their origin and underlying population. Establishing the properties of FRBs has become a key goal in radio transient studies, with significant investments in both hardware and software being made to this end. In order to keep up with expected fast transient rates, we need to improve our understanding of the underlying FRB population. Whether using Parkes or UTMOST, CHIME or Apertif, it is crucial we understand the effects of both propagation and instrumentation on an emitted FRB. In this presentation I will discuss an open-source population synthesis code for FRBs -- FRBPOPPY -- to help the community prepare for the upcoming surveys. FRBPOPPY is capable of calculating expected fast transient detection rates, estimating observable parameters and deducing emission properties. With a new generation of telescopes starting to detect FRBs, such a tool will enable us to c
apitalise on available theories and unravel the mystery that is FRBs.'

First name: Alexander
Last name: Mushtukov
Email Address: al.mushtukov@gmail.com
Affiliation: Leiden Observatory
Position: PostDoc
Presentation request:
Type: Talk
Title: 'ULX pulsars and features of extreme accretion onto magnetised neutron stars'
Abstract: 'X-ray pulsars (XRPs) form a special class in a family of accreting neutron stars (NSs). They stand out from the other classes due to their strong magnetic field, which typically exceeds 1.e12 G and affects even fundamental properties of matter. Recent discoveries of pulsations from ultra-luminous X-ray sources (point-like X-ray sources with the observed luminosity well above 1.e39 erg/s) - ULXs - have opened a new chapter in studies of XRPs. The classical theoretical limitation for luminosity is given by the Eddington value, which is about 2.e38 erg/s for NSs. Discovery of ULXs powered by accreting NSs is a challenge for theoretical astrophysics. At the same time, we know a few bright transient XRPs, which might be considered as a link between normal XRPs and ULXs. I will discuss some basic features of XRPs, which arise and become essential at high mass accretion rates and give a possible explanation of ULXs powered by accreting NSs. '

First name: liam
Last name: connor
Email Address: liam.dean.connor@gmail.com
Affiliation: UvA -- Anton Pannekoek Institute for Astronomy
Position: PostDoc
Presentation request:
Type: Talk
Title: 'An FRB search with the Apertif Lofar Exploration of the Radio Transient Sky'
Abstract: 'With the Apertif Lofar Exploration of the Radio Transient Sky (ALERT) we will search for fast radio bursts (FRBs) by taking advantage of the proximity of two world class radio telescopes. We will detect FRBs at 1400 MHz using Apertif on the Westerbork array, and send triggers to Lofar where typical bursts will arrive a couple of minutes later. In this talk I will present an update on our survey, including the multiple detections of the first repeating FRB, and an overview of the new time-machine mode that has been commissioned and verified on Lofar. This time machine mode saves raw voltage data, allowing us to localize FRBs and study them at low frequencies with higher sensitivity than ever before. I will also discuss what is known about the FRB rate at low frequencies, and the difficulties associated with detecting highly-dispersed single pulses below 200 MHz. '

First name: Robin
Last name: Björklund
Email Address: robin.bjorklund@kuleuven.be
Affiliation: KU Leuven
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Impact of mass loss for the evolution of massive stars '
Abstract: 'Mass loss has a significant, even dominant, influence on the life cycles of massive stars, as well as in determining the properties of the exotic remnants left behind when these stars die in supernova explosions. Massive-star mass-loss rates are very high due to their winds driven by radiation and comprise a key uncertainty in current models of stellar evolution.
This work focuses on providing new massive-star mass-loss rates for evolution calculations, computed from novel theoretical models of radiation-driven stellar winds. Current evolution models, like MESA, use pre-calculated recipes for mass loss, typically derived using simple scaling recipes. However, such recipes for massive stars have often been found to overpredict mass-loss rates as compared to empirical values. Using the state-of-the-art NLTE atmosphere and wind code FASTWIND, the structure and synthetic spectra are here computed for these stars by simultaneously solving the hydrodynamics and radiative-transfer equations. This provides new, unprecedented theoretical predictions of mass-loss rates, which are then also coupled to the interior structure of the stars in the evolution simulations. This allows us to analyze the life of the massive star and also predict observables such as SEDs and synthetic spectra. A key result here will be to carefully compare our new, detailed predi
ctions with old ones that use simplified scaling recipes for mass loss. '

First name: Leon
Last name: Koopmans
Email Address: koopmans@astro.rug.nl
Affiliation: Kapteyn Astronomical Institute
Position: Staff
Presentation request:
Type: Talk
Title: 'New limits on the 21-cm signal from the Epoch of Reionization with LOFAR'
Abstract: 'I will review the latest results on the 21-cm signal of neutral hydrogen from the LOFAR Epoch of Reionization Key Science Programme. In particular, I will present new breakthrough results on the power-spectrum of the 21-cm signal, the deepest thus far obtained by any instrument at z~9, and show that this limit is already astrophysically interesting. I will also present new results from an ongoing multi-cycle program with the LOFAR AARTFAAC system to detect the 21-cm signal from the Cosmic Dawn at z~18, where the EDGES team recently claimed detection of the global 21-cm signal.'

First name: Joseph
Last name: Callingham
Email Address: callingham@astron.nl
Affiliation: ASTRON
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Stellar systems at low frequencies: Radio exoplanets'
Abstract: 'For more than thirty years, radio astronomers have searched for auroral emission from exoplanets. With LOFAR we have recently detected strong, highly circularly polarised low-frequency (144 MHz) radio emission associated with a M-dwarf - the expected signpost of such radiation. The star itself is quiescent, with a 130-day rotation period and low X-ray luminosity. In this talk, I will detail how the radio properties of the detection imply that such emission is generated by the presence of an exoplanet in a short period orbit around the star, and our follow-up radial-velocity (RV) observations with Harps-N to confirm the exoplanet\'s presence. Our study highlights the powerful new and developing synergy between low-frequency radio astronomy and RV observations, with radio emission providing a strong prior on the presence of a short-period planet. I will conclude the talk detailing how the radio detection of an star-exoplanet interaction provides unique information for exoplanet climate and habitability studies, and the extension of our survey to other stellar systems.'

First name: Frits
Last name: Sweijen
Email Address: sweijen@strw.leidenuniv.nl
Affiliation: Leiden Observatory
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Sub-arcsecond resolution at 150 MHz: spatially resolving a z=2.4 radio galaxy with the International LOFAR Telescope'
Abstract: 'The spectral index-redshift relation has historically been used to find high redshift radio galaxies, but the origin of this relation is still unknown. To test different theories, spatially resolved spectral modeling of HzRGs is required. Low frequencies are particularly important for this, to fix the injection index in these models. However, the inherently low angular resolution of low-frequency telescopes has prevented detailed spatially resolved spectral studies of these objects. Using the High Band Antennas of the International LOFAR Telescope, spatial resolutions of a few tenths of arcseconds can now be obtained at frequencies of about 150 MHz. Here we present the first spatially resolved spectral study of a high redshift radio galaxy from MHz to GHz frequencies. We present the z = 2.429 radio galaxy 4C 43.15, reaching 0.3\'\' or 2.482 kpc at 150 MHz. This is done together with 55 MHz data and archival VLA data at 4.7 GHz and 8.44 GHz. Spectral index maps at 0.9\'\' and 0.38\'\' are presented, showing a range of alpha=-0.99 to -1.38 for the northern radio lobe and -0.62 to -1.46 for the southern lobe. With a magnetic field strength of B = 5.24 nT, we fit a JP Tribble spectral ageing model to the data, finding injection indices of -0.8 (north) and -0.65 (south), respectively, and a spectral age of t_spec = 1.1 \\pm 0.1 Myr.'

First name: Alexandar
Last name: Mechev
Email Address: apmechev@strw.leidenuniv.nl
Affiliation: Leiden Observatory
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Bug Spray: Safely deploying software and ensuring reproducibility'
Abstract: 'Broadband LOFAR data is processed by scripts and software that has a high release rate. To deploy LOFAR software, we need to ensure correctness of software, minimize failure rates and make testing on multiple platforms easy. We present a method to automatically build and test the LOFAR software, and automatically run the LOFAR Direction Independent Calibration pipeline on a test data set. With this set-up we can release Weekly and Monthly versions as well as major releases. Crucially, we can create Persistent Identifiers for our software, making scientific reproducibility easy. Our testing framework can easily integrate multiple LOFAR pipelines and ensure the accuracy of scientific results even for fast moving software packages. '

First name: Emily
Last name: Cannon
Email Address: emily.cannon@kuleuven.be
Affiliation: KU Leuven
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Unveiling the inner circumstellar environment of red supergiant stars'
Abstract: 'During their red supergiant (RSG) evolution phase, massive stars show powerful stellar winds, which strongly influence the supernova progenitor properties and control the nature of the compact object that is left behind. Material that is lost in the stellar wind, together
with that ejected in the final core collapse, contributes to the chemical enrichment of the interstellar medium. The mass-loss properties of RSGs are however poorly constrained: for example, little is known about the wind driving mechanism. To provide better constraints
on both the mass-loss rates and processes, high angular resolution observations are needed to unveil the inner regions of the circumstellar environment, where the mass loss is triggered.
Using the VLT/SPHERE/ZIMPOL adaptive optics imaging polarimeter, spatially resolved images of a sample of nearby RSGs were obtained in multiple filters. Comparison of these observations with models from the dust radiative transfer code, MCMax, provides information on geometrical structures in the inner wind, the onset of the dust condensation radius and the spatial distribution of dust grains, and dust properties such as grain sizes. As dust grains may play a role in initiating and/or driving the outflow, this could provide us with clues as to the wind driving mechanism.'

First name: Kelly
Last name: Gourdji
Email Address: kgourdji@gmail.com
Affiliation: Anton Pannekoek Institute
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'A sample of low energy bursts from FRB 121102'
Abstract: 'FRB 121102 was the first FRB discovered to repeat. Here, I present 41 bursts detected at 1.4 GHz with the Arecibo telescope on two consecutive days. This sample has allowed us to probe unprecedentedly low energies during a period of high detection rate. The bursts are generally detected in less than a third of the 580-MHz observing bandwidth, demonstrating that narrow-band FRB signals may be more common than previously thought. I show that the bursts are likely faint versions of previously reported high signal-to-noise, multi-component bursts. There is a striking lack of bursts detected below 1.35 GHz and I show that our data suggests preferred radio emission frequencies that vary with epoch. A power law approximation of the cumulative distribution of burst energies yields an index −1.8 ± 0.3 that is much steeper than the previously reported value of −0.7. The discrepancy may be evidence for a more complex energy distribution. Furthermore, I test the hypothesis that the associated persistent radio source is generated by the emission of many faint bursts. I explain the distribution of burst wait times, which appears to be bimodal. Finally, I discuss the observational implications of our results and in particular caution against exclusively integrating over the full observing band during FRB searches, which can bury bursts in noise.'

First name: Joey
Last name: Mombarg
Email Address: joey.mombarg@kuleuven.be
Affiliation: Instituut voor Sterrenkunde, KU Leuven
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Masses, ages and core properties of intermediate-mass stars from asteroseismology and spectroscopy'
Abstract: 'Asteroseismology provides a window into the stellar interior by utilising the observed frequencies of stellar oscillations. There exists a zoo of pulsators, but one particularly interesting type of pulsators are gamma Doradus (gamma Dor) stars, i.e. early-A to late-F main-sequence stars comprising a convective core. These stars exert gravity modes for which the dominant restoring force is buoyancy. As these modes are most sensitive to the properties of the near-core region, rendering gamma Dor excellent candidates to probe the deep stellar interior. The periods of gravity modes can be characterised by the so-called asymptotic period spacing. We have combined this measured seismic parameter with the effective temperature and surface gravity from high-resolution spectroscopy to infer the (core) mass, age, metallicity and the level of core overshooting of a sample of gamma Dor stars, by fitting these three observables to grids of stellar models. Since the observables are correlated, we employ new forward seismic modelling scheme which takes these correlations into account.
In this talk, I will present results from the first forward asteroseismic modelling of an ensemble of 37 gamma Dor stars combined with the near-core rotation rate from the literature. The sample contains stars with ages ranging from zero- to terminal-age main sequence allowing us to conclude that efficient angular momentum transport occurs already in the early phases of the main sequence. '

Last name: Chruslinska
Email Address: m.chruslinska@astro.ru.nl
Affiliation: Radboud University
Position: PhDStudent
Presentation request:
Type: Talk
Title: Birth metallicities of stars over the cosmic history
Abstract:
Metallicity is one of the crucial factors that determine stellar and binary evolution.
Hence, to characterize the properties of stellar populations one needs to know the fraction of stars forming at different metallicities.
Knowing how this fraction evolves over the cosmic history is necessary e.g. to estimate the rates of occurrence of any stellar or binary evolution related phenomena
(e.g. different types of supernovae, double compact object mergers or gamma ray bursts).
Such theoretical rate estimates can be for instance confronted with observational limits to validate the assumptions about the evolution of the progenitor star or system leading to a certain transient.
However, to perform the comparison correctly one needs to know the uncertainties related to the assumed star formation history and chemical evolution of the Universe.
This is especially important in the case of transients whose formation scenarios are particularly sensitive to metallicity, e.g. long gamma ray bursts and double black hole mergers.
Different approaches have been taken in the literature to learn about the distribution of the cosmic star formation rate at different metallicities and redshifts.
Our method is to combine the observational scaling relations from various observational studies describing the properties of star forming galaxies (star formation rate, mass, metallicity).
We address the question of uncertainty of the obtained distribution due to the currently unresolved problems in the determination of various characteristics of galaxies and the scaling relations, such as the absolute metallicity scale or the flattening in the star formation mass relation.'

First name: Hannah
Last name: Stacey
Email Address: h.r.stacey@astro.rug.nl
Affiliation: Kapteyn Astronomical Institute / ASTRON
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Gravitational lens flux-ratio anomalies on kpc-scales: Dark sub-haloes or large-scale substructure?'
Abstract: 'Almost all well-studied four-imaged gravitationally-lensed quasars have image flux ratios that are inconsistent with those expected from a smooth lensing mass distribution. These flux-ratio anomalies are thought to be primarily due to low-mass sub-haloes either within the lensing galaxy or along the line-of-sight, as predicted by cosmological simulations, and therefore useful to constrain dark matter models. I will present observations of five gravitationally-lensed quasars with the Atacama Large (sub-)Millimetre Array in which we resolve extended emission from both heated dust and molecular gas associated with the quasar host galaxies. Despite the sources being extended on kpc-scales, as opposed to pc-scales observed at optical/infrared wavelengths, in every case we observe comparable surface brightness anomalies in both dust and gas emission. This presents a new avenue to investigate the persistence of flux-ratio anomalies unaffected by source variability, microlensing or other extrinsic effects. However, furthermore, the evidence that flux-ratio anomalies persist in these data suggests that either the assumed sub-haloes responsible are much more massive than expected from studies in the optical/infrared. Alternatively, the anomalies are the effect of a more complex large-scale mass distribution in the lens. Either result has important implications for the interpretation of flux-ratio anomalies in the context of dark matter models. I will present the preliminary results of our lens modelling analysis.'

First name: Irene
Last name: Polderman
Email Address: i.polderman@astro.ru.nl
Affiliation: Radboud University Nijmegen
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Probing the Galactic magnetic field using radio observations of absorbed HII regions'
Abstract: 'We model synchrotron emissivity in the Milky Way, with the aim to provide insight into the values of the cosmic ray density and the magnetic field strength perpendicular to the line-of-sight of which these emissivities are a direct product. The models are fit to a catalog of low radio frequency (< 90MHz) measurements of synchrotron emissivities (K/pc) towards HII regions in the plane of the Milky Way, assembled from the literature. We included existing Galactic Magnetic field (GMF) models in this modeling for the first time, as presented in Polderman et al. (2019). In the continuation of this work we use Galprop to simulate the cosmic ray density in the Milky way and significantly expand the number of GMF models that we compare to each other and to the emissivity values in our catalog. I will discuss results from these comparisons and put forward new scenarios regarding the Galactic cosmic ray density and magnetic field strength.'

First name: Carole
Last name: Jackson
Email Address: jackson@astron.nl
Affiliation: ASTRON
Position: Staff
Presentation request:
Type: Talk
Title: 'ASTRON & the frontiers of radio astronomy in the 2020□s'
Abstract: 'ASTRON is the Netherlands Institute for Radio Astronomy. Our mission is to □make discoveries in radio astronomy happen.□ We do this by focussing on a number of key national astronomy research themes, coupled to the operation of our world-class observing facilities and a visionary technology research program.
Over the next decade ASTRON will lead the Netherlands□ contributions to the SKA build, commissioning and science phases. During the same time period LOFAR will be upgraded to □LOFAR 2.0□, and we continue to set the foundation for a Science Data Centre to serve the needs of 2024+ astronomers. In this talk I will outline these efforts, and in particular I will illustrate how LOFAR2.0 and SKA1_LOW will be complementary in what promises to be a very exciting future for radio astronomy.'

Title: Imaging the Event Horizon in the Galactic Center and M87

Name: Heino Falcke, Radboud University

Abstract:

When illuminated by ambient light, the event horizon of black holes will cast a dark shadow. For the supermassive black holes in the Galactic center and in M87, this shadow is detectable with the “Event Horizon Telescope” (EHT), a global mm-wave very long baseline interferometry experiment. The Galactic Center hosts a compact radio source, Sgr A*, with a mass of only 4 Million solar masses, determined precisely from stellar orbits. This gives a robust prediction for a shadow size, allowing detailed tests of general relativity there. However, the imaging is challenging due to rapid source variability and image blurring in the interstellar medium. Imaging of M87 is not affected by these effects, but the black hole mass is more uncertain. With advanced computer simulations the appearance of the sources and their shadows can be modelled and predicted in detail. A first global campaign of the EHT was successfully conducted in 2017 and the data is currently being analysed and we discuss here the first results.

Name: Inés Pastor Marazuela
Title: EXOD: Searching for fast transients in XMM-Newton data
Abstract:
XMM-Newton has produced the largest X-ray catalog to date. In this catalog, the variability of sufficiently bright sources is automatically studied through their fractional variability and χ 2 tests. However, these methods require a minimum number of counts to be reliable and thus short duration outbursts cannot be detected by the same means. Examples of such objects are strongly redshifted short gamma-ray bursts, type-I X-ray bursts in distant galaxies, or possibly X-ray counterparts to fast radio bursts.
In order to automatically search XMM-Newton data for these short and faint transients, we have developed EXOD, the EPIC-pn XMM-Newton Outburst Detector. It computes the variability of the whole field of view and then applies an imaging technique to detect variable sources.
Here I will present the algorithm along with some of the most interesting results obtained. This includes the redetection of a plethora of kinds of previously known variable sources, and the finding of new variable sources that had not been classified as variable by XMM-Newton's automatic pipeline. EXOD can be used to conduct automatic searches for short transients in new observations, which has an increasing importance in the era of multimessenger astronomy.

First name: Sara
Last name: Issaoun
Email Address: s.issaoun@astro.ru.nl
Affiliation: Radboud University
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Calibration and imaging of the supermassive black hole in M87 with the EHT'
Abstract: 'The EHT collaboration released the first results of its 2017 observing run on April 10. The supermassive black hole in the radio galaxy M87 was imaged, showing an asymmetric ring encircling the shadow of the black hole□s event horizon. The high observing frequency, array heterogeneity and susceptibility to atmospheric turbulence led to the development of three independent pipelines for phase calibration, a thorough understanding of telescope sensitivities and properties, a use of information redundancy to refine calibration, and suite of validation tests and systematic error budget estimates. In this talk, I will present the data processing and calibration from correlated data to fully vetted science-ready datasets for analysis. I will also be discussing the imaging process behind the now-famous first image of a black hole, which consists of two important stages: blind imaging and software evaluations. '

First name: Shan-Shan
Last name: Zhao
Email Address: S.S.Zhao@astro.ru.nl
Affiliation: Radboud University
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Measurements of the shadow and mass of M87* with EHT 2017 data'
Abstract: 'The shadow of a black hole is shaped by the photon unstable circular orbit near the event horizon, so the measurement of shadow is expected to reveal the spacetime of the black hole. The first EHT results of M87* have been published on April 10, in which the crescent diameter of the shadow is measured to be 42 +/- 3 muas by using EHT 2017 data. In this talk I will show the method of fitting geometric models to the VLBI observation in the visibility domain and measure the shadow size. Additionally, I will show the crescent models are chosen in the measurement because they are overwhelmingly prefered to the other geometric models in the statistical comparison. By folding in the distance measurements, we calculate the mass of M87* is 6.5 +/- 0.7 billion solar masses, which is consistent with the result of stellar dynamical mass measurements. The measurement of the shadow and mass strongly support the hypothesis that the central object in M87 is a Kerr black hole.'

First name: Freek
Last name: Roelofs
Email Address: f.roelofs@astro.ru.nl
Affiliation: Radboud University
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Comparing the EHT 2017 data to physical models of M87*'
Abstract: 'On 10 April 2019, the EHT Collaboration presented and published the first results of its 2017 observing run. The supermassive black hole M87* was imaged as an asymmetric ring at 230 GHz, indicative of the shadow of the black hole□s event horizon. In this talk, I will present the methods and results of comparing the 2017 data to physical source models. The EHT Collaboration constructed a library of ray-traced general relativistic magnetohydrodynamics (GRMHD) simulations of M87*, which were fit to the EHT data. The fitted GRMHD model images were run through a synthetic data pipeline, which includes realistic data corruption and calibration effects based on station and weather parameters measured during the EHT campaign. The images reconstructed from these show remarkable similarity to the observed image of M87*. I will also discuss the use of synthetic observations for assessing the expected image quality of an enhanced EHT array with added stations in Greenland, France, Ari
zona, and Namibia. On the longer term, high-frequency observations with a Space VLBI array could produce images with an angular resolution that is an order of magnitude higher.'

First name: Michael
Last name: Janssen
Email Address: m.janssen@astro.ru.nl
Affiliation: Radboud University
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'The 2017 observations of the Event Horizon Telescope'
Abstract: 'The Event Horizon Telescope (EHT) is a global VLBI array with the capability to study millimeter wave emission from extragalactic radio sources with an unprecedented micro-arcsecond resolution. In a 2017 observing run, the EHT observed M87 and Sgr A* - the two primary EHT targets - alongside several other AGN sources. Eight telescopes participated in this observing session, including the extremely sensitive phased-up Atacama Large Millimeter/submillimeter Array (ALMA). A first result from this observing session has been revealed on 10 April 2019 in six simultaneous press conferences around the world: The first image of a black hole.
In this talk, I will discuss how the EHT is able to resolve the innermost regions of active galactic nuclei, focusing on the preceding technical developments, the coordination of the 2017 observing run, and the correlation process of ~4 petabytes of raw data. I will conclude with an overview of the next scientific results which can be anticipated from the EHT consortium in the near future.'

First name: Jake
Last name: Noel-Storr
Email Address: noelstorr@astro.rug.nl
Affiliation: Kapteyn Institute
Position: Staff
Presentation request:
Type: Talk
Title: 'Astronomers and Students as Education and Outreach Professionals'
Abstract: 'Astronomy is well known as a field that inspires learners of all ages around the world, and professional astronomers, and postgraduate and undergraduate students often engage in education and outreach efforts. In this talk I will describe ways in which we know that people understand the Universe, and how, by understanding how and why people learn, we can improve astronomy education and outreach outcomes for all learners. I will discuss what we know know about sharing astronomy with others in a variety of formal and informal education settings, as well as ways that scientists can effectively (or ineffectively!) work with educators, families, communities and students to intentionally enhance knowledge, skills, attitudes and behaviors.'

First name: Shuxu
Last name: Yi
Email Address: Shuxu.Yi@ru.nl
Affiliation: Department of Astrophysics, Radboud University
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Gravitational wave toolbox'
Abstract: 'The discoveries by LIGO and Virgo bring the world into the gravitational wave astronomy era. In the near further, new GW observatories will spring up: on the ground, there will be AIGO, LIGO-India, KAGRA, Einstein telescope and Cosmic Explore; in the space, there comes eLISA and Tianqin; Besides, there are pulsar timing arrays searching for the ultra-low frequency gravitational waves.
More and more astronomers, from all backgrounds, need to understand the properties of different kinds of GW observatories. More specifically, what sources are expected to be detected by a certain GW observatory? How many of them will be detected given a certain observing time, and what will be the distribution of physical parameters of the population? What will the electromagnetic wave counter parts look like? Scientists proposing new GW observatories also want to have a simple tool to estimate how different design parameters (e.g., arm length of the interferometer, laser power) will influence the scientific outcomes.
Gravitational wave toolbox is a project that will eventually provide the needed tools. The ultimate form of the toolbox will be a website. With it people can easily get the answers of above questions.'

First name: Jorrit
Last name: Hagen
Email Address: hagen@astro.rug.nl
Affiliation: Kapteyn Astronomical Institute
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'The tilt of the velocity ellipsoid in the Milky Way with Gaia DR2'
Abstract: 'The velocity distribution of stars close to the Sun is one of the most sensitive probes of the gravitational potential of the Galaxy, and hence of its dark matter distribution. In particular, the shape of the dark halo (e.g. spherical, oblate, prolate) determines velocity correlations, and different halo geometries imply measurable differences.
In this talk I will present the correlations (or better: tilt angles) in the velocity distribution of stars for a large fraction of the Milky Way disk, ranging from the inner (R=3 kpc) to the outer (R=13 kpc) Galaxy and up to 4 kpc away from the Galactic plane. We have selected a high accuracy sample from the Gaia DR2 catalog and take measurement errors into consideration.
We find that the velocity ellipsoid, which measures correlations between vR and vZ, clearly changes shape moving from spherical alignment in the inner Galaxy (R<6 kpc) towards near cylindrical alignment at R ~ 12 kpc. We present a simple analytic function that describes the tilt angles observed. The trends of the velocity ellipsoid with radius and height are used to set additional constraints on mass models of the Milky Way.
We checked that different stellar populations show similar trends in the tilt angle and that the tilt angles do not strongly vary with Galactic azimuth. We however show that the systematic parallax errors, present in Gaia DR2, have likely enhanced the observed change in type of alignment with radius: for R<Rsun the tilt angles tend to become steeper (more spherically aligned), while for R>Rsun the tilt angles tend to become shallower (more cylindrically aligned).'

First name: Hiddo
Last name: Algera
Email Address: algera@strw.leidenuniv.nl
Affiliation: Leiden Observatory
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'A Multi-Frequency View on the Faint Star-forming Radio Population'
Abstract: 'The radio window offers a dust-unbiased and high-resolution view of the high-redshift galaxy population. In the faint regime (S3 GHz ≲100 μJy), this population is strongly dominated by star-forming galaxies, which show radio emission consistent with the well-studied far-infrared-radio correlation. Historically, such faint star-forming sources have predominantly been studied at low radio frequencies, where their emission is dominated by non-thermal synchrotron radiation. However, the higher frequencies (ν ≳ 30 GHz, rest-frame) offer an additional and potentially superior tracer of star formation: thermal free-free emission (FFE). Through the combination of various deep VLA datasets over the COSMOS and GOODS-North fields, we study the spectrum of the faint radio population at up to five different frequencies (1.4, 3, 5, 10 and 34 GHz). The 3 and 10 GHz data in particular reach depths of ~0.5 and ~0.4 μJy/beam, respectively, allowing the additional
exploration of the average radio spectrum of the nanoJansky population through a multi-frequency stacking analysis. We present initial results on the isolation of FFE for the faint radio population and investigate its potential as a high-redshift star formation rate tracer.'

First name: helmer
Last name: koppelman
Email Address: koppelman@astro.rug.nl
Affiliation: Kapteyn Institute
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Identifying and characterising substructure in the local stellar halo with Gaia DR2'
Abstract: 'The stellar halo of the Milky Way is the perfect testbed for galaxy formation theories. Data from Gaia DR2, a survey that provides high-quality astrometry and photometry, provides a unique way probe the substructure in the nearby stellar halo potentially associated to merger debris.
Our analysis of the Gaia data has revealed tidal debris in the solar neighbourhood stemming from several disrupted objects. The photometry and chemical abundances of the stars in these structures together with dynamical models allows us to infer the properties of the different progenitors, including the time of accretion.
Most of this work has made use of a relatively small sample of several million stars, but I will also present some preliminary results using the much larger Gaia 5D sample, containing 1.4 billion objects.'

First name: Jacqueline
Last name: Hodge
Email Address: hodge@strw.leidenuniv.nl
Affiliation: Leiden Observatory
Position: Staff
Presentation request:
Type: Talk
Title: 'New insights from (sub-)kpc ALMA imaging of SMGs'
Abstract: 'The Atacama Large Millimeter Array (ALMA) is providing a radical new view of luminous submillimeter galaxies at high-redshift. I will present recent ALMA observations of the dust continuum, [CII], and CO in SMGs from the ALESS survey at ~kpc and even sub-kpc scales that provide key insight into the morphology, dynamics, and ISM physics in these systems. We see evidence for rotating gas disks, low (ULIRG-like) CO-to-H2 conversion factors, and internal [CII] deficits that suggest thermal [CII] saturation. Our most recent ~500 pc dust continuum imaging reveals large-scale morphologies suggestive of bars, star-forming rings, and even spiral arms. If confirmed by kinematics, the potential presence of non-axisymmetric structures would provide a means for net angular momentum loss and efficient star formation, helping to explain the very high star formation rates measured in SMGs.'

First name: Dieuwertje
Last name: van der Vlugt
Email Address: dvdvlugt@strw.leidenuniv.nl
Affiliation: Leiden University
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Constraining the ultra-faint radio population with the COSMOS-XS survey
'
Abstract: 'Deep radio observations are crucial to obtain a clear, dust-unbiased view of star formation across cosmic time. However, before radio emission can be used as probe for star formation, one has to ensure the observed radiation is not instead powered by AGNs.
I will present a general overview of an ultra-deep matched-resolution radio survey probing the COSMOS field: the COSMOS-XS survey. These Very Large Array (VLA) radio observations at 10 and 3 GHz reach sensitivities of rms ~0.39 uJy beam-1 and ~0.55 uJy beam-1, respectively.
Using these deep radio observations and the wealth of ancillary data available over the COSMOS field, we are able to decompose the radio source counts obtained at 3 GHz into AGNs and star-forming sources. This allows us to put constraints on these populations at the microJansky level. We find that 95% of the radio sources at 10 uJy can be classified as star forming. This implies that next-generation radio telescopes will be highly sensitive to the star-forming radio population.'

First name: Yannick
Last name: Bahé
Email Address: bahe@strw.leidenuniv.nl
Affiliation: Sterrewacht Leiden
Position: PostDoc
Presentation request:
Type: Talk
Title: 'The fate of satellite galaxies in massive clusters'
Abstract: 'Satellite galaxies in clusters are subject to tidal forces that strip their matter and may even disrupt them completely. The stars removed in this way may accumulate in the diffuse intra-cluster light. In my talk, I will present insights into this process from the Hydrangea simulations, a suite of high-resolution hydrodynamical cosmological zoom-in simulations of massive galaxy clusters and their large-scale environment. According to these simulations, the complete disruption of satellites is rare in massive clusters themselves, but common while galaxies are \"pre-processed\" in infalling groups. I will discuss the extent of stellar and dark matter stripping seen in the simulations, and the implications for the origin of brightest cluster galaxies, the intra-cluster light, and the dark matter haloes of massive galaxy clusters. '

First name: Suma
Last name: Murthy
Email Address: murthy@astro.rug.nl
Affiliation: Kapteyn Astronomical Institute
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'Feedback from low-luminosity radio AGN: A case study of B2 0258+35'
Abstract: 'The interplay between the nuclear activity and the interstellar medium of galaxies plays an important role in their evolution: the gas accreting onto the dormant supermassive black hole turns it into an active galactic nucleus (AGN) and the ensuing activity is believed to starve the host galaxy of the fuel needed to form stars. The contribution of radio-loud AGNs to this feedback effect is yet to be well understood, more so that of low luminosity radio AGNs. These make up a significant fraction of the radio-loud AGN population, but are generally believed to be too weak to cause any significant impact. I will present the case of one such radio AGN B2 0258+35. Here, a combination of HI absorption, CO emission, continuum studies, and numerical simulations indicate that low power radio activity, under favourable circumstances, can shock heat gas out to distances much beyond the physical reach of the radio jets as well as result in the formation of large scale radio structures.
This thereby highlights the potential importance of low luminosity radio AGNs in the context of feedback. '

First name: Nadejda
Last name: Blagorodnova
Email Address: n.blagorodnova@astro.ru.nl
Affiliation: Radboud University
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Common envelope transients: buried in infrared'
Abstract: 'Most stars in our Universe live in binaries. Unstable mass transfer from one star to another can lead to the formation of a common envelope: a shared gaseous shell where both stars orbit. The end of this phase is marked by the quick spiral-in of the secondary star towards its companion, leading to violent interactions between the components. The whole, or part of the binary\'s common envelope may get ejected, and the binary may even completely merge. This last phase has been observed as astrophysical transients called luminous red novae (LRNe), allowing us to study the progenitor stars, the energetics of the outburst and the properties of the ejected material. In my talk I will present the results of our photometric and spectroscopic follow-up campaign for two LRNe, one in NGC45 and another in M101, associated with massive stellar progenitors. While both transients have quickly faded in the optical bands, their infrared signatures reveal the formation of cold dust shells reprocessing the light of the newly formed stars.'

First name: Claire
Last name: Baxter
Email Address: c.j.baxter@uva.nl
Affiliation: University of Amsterdam
Position: PhDStudent
Presentation request:
Type: Talk
Title: 'A comprehensive survey of exoplanet atmospheres with Spitzer/IRAC'
Abstract: 'Studying exoplanets affords us the opportunity to understand the sheer diversity of planets in different physical regimes. We use the two IRAC bandpasses from the warm Spitzer mission and the statistical power of a transit survey to test the theoretical predictions of exoplanet atmosphere properties across a broad regime of parameter space. Our survey ranges from the coolest gas giant planets to the ultra-hot Jupiters. It spans a range of mass, radii, equilibrium temperature and differing atmospheric compositions. In particular, we probe the carbon monoxide, methane and water content of these atmospheres from emission and transmission spectra.
We classify the sample into groups and use the properties of individual planets within these groups to understand their collective diversity. We see several trends emerging in our data. Firstly, we measure emission spectra of the ultra-hot jupiters and find that they deviate strongly from the rest of the sample. This hints towards different atmospheric properties and behaviours in these ultra-hot atmospheres, we discuss the possibilities for such a trend and form links with possible temperature inversions in the upper atmosphere and reduced efficiency of heat redistribution. Secondly, we observe a deviation from cloud-free equilibrium chemistry models in the coolest planets, combining this with knowledge gained from HST spectra, we note that this could be a signature of clouds and in some cases non-equilibrium chemistry effects. Ultimately, our work places new constraints on the diverse families of exoplanet atmospheres, as well as on possible formation and evolution scenarios.'

First name: Roberto
Last name: Maiolino
Email Address: r.maiolino@mrao.cam.ac.uk
Affiliation: Kavli Institute for Cosmology, University of Cambridge
Position: Staff
Presentation request:
Type: Talk
Title: 'Advances in understanding the earliest galaxies'
Abstract: 'Understanding the earliest phases of galaxy formation is one of the most fascinating and most challenging areas of research of modern astrophysics. Recent observing campaigns with the most advanced observatories, along with extensive and detailed theoretical modelling and numerical cosmological simulations, have enabled tremendous progress in this field, by identifying and characterising primeval galaxies and their multiple components, such as their stellar population, their interstellar and circumgalactic medium, their chemical enrichment and the supermassive black holes hosted at their centres.
I will review most of these aspects. I will also provide an overview of the open issues and the progress expected in this field through forthcoming observing facilities.'

First name: David
Last name: Baneke
Email Address: d.m.baneke@uu.nl
Affiliation: Descartes Centre, Utrecht
Position: Staff
Presentation request:
Type: Talk
Title: 'History of the IAU: the book'
Abstract: ''

First name: Pratika
Last name: Dayal
Email Address: p.dayal@rug.nl
Affiliation: Kapteyn Astronomical Institute
Position: Staff
Presentation request:
Type: Talk
Title: 'Using the early Universe to probe the nature of Dark Matter'
Abstract: 'Weakly interacting cold dark matter (CDM) particles, which are otherwise extremely successful in explaining various cosmological observations, exhibit a number of problems on small scales. One possible way of solving these problems is to invoke (so-called) warm dark matter (WDM) particles with masses of the keV range. Since the formation of structure is delayed in such WDM models, it is natural to expect that they can be constrained using observations related to the first stars, e.g., the 21 cm signal from cosmic dawn. In this work, we use a detailed galaxy formation model, Delphi, to calculate the 21 cm signal at high-redshifts and compare this to the recent EDGES observations. We find that while CDM and 5 keV WDM models can obtain a 21 cm signal within the observed redshift range, reproducing the amplitude of the observations requires the introduction of an excess radio background. On the other hand, WDM models with masses less than 3 keV can be ruled out since they are unable to match either the redshift range or the amplitude of the EDGES signal, irrespective of the parameters used. Comparable to values obtained from the low-redshift Lyman Alpha forest, our results extend constraints on the WDM particle to an era inaccessible by any other means; additional forthcoming 21 cm data from the era of cosmic dawn will be crucial in refining such constraints.'

First name: Merlijn
Last name: Jakobs
Email Address: jakobs@lorentzcenter.nl
Affiliation: Lorentz Center
Position: Staff
Presentation request:
Type: Talk
Title: 'Lorentz Center: everything you thought you knew'
Abstract: 'The Lorentz Center in Leiden is the Dutch national center for scientific workshops. Frequented by astronomers from around the world, one could say it doesn't need an introduction. Yet this brief talk will do exactly that: remind you of the who, what, why, where, when and how of organising a successful workshop that suits your needs. Whether you are experienced faculty, aspiring post-doc or starting PhD student, the Lorentz Center's mission is to facilitate your research by stimulating scientific creativity and interaction.'

First name: F. Javier
Last name: Alonso-Floriano
Email Address: alonso@strw.leidenuniv.nl
Affiliation: Leiden University
Position: PostDoc
Presentation request:
Type: Talk
Title: 'Detection of He I at 1083 nm with transmission spectroscopy: A new window to observe atmospheric evaporation from the ground'
Abstract: 'Close-in planets are exposed to extreme stellar irradiation capable of evaporating their atmospheres. This mass loss could even be strong enough to completely evaporate the gas envelopes of small planets, which can explain the population of hot super-Earths detected. However, for the last 16 years, most of the information related to this relevant process has relied on space-based observations of the hydrogen Lyman-alpha line in the far ultraviolet, which is strongly affected by interstellar absorption even for the closest targets. Last year a new window to observe atmospheric evaporation opened and it is causing a breakthrough in the field. The helium triplet at 1083 nm is providing us of an unprecedented view on atmospheric evaporation. On the contrary than Lyman-alpha, the He triplet is virtually free of interstellar absorption and it is observable from the ground with high-resolution spectrographs. We are using the high-resolution spectrograph CARMENES, the only ground facility available so far, to study this feature. I will provide a summary of the latest detections published and present the newest results that sustain the relationship between stellar irradiation and He signature, which seems to show an experimental lower limit below which no-Helium has been detected.'