NSAASSR 2023
List of Selected Abstracts

1. **Name**: Arya S J
Registration Number: NS_103
Institution: Postgraduate Student Fourth Semester
Type of Presentation: Oral
Title: Exploring The Star Formation Activity In NGC 2915
Abstract: Blue compact dwarfs (BCDs) are low-luminosity and low-metal content dwarf galaxies experiencing violent bursts of star formation. NGC 2915 is a BCD galaxy located at the relatively nearby distance of 15 million light-years, just outside the Local Group. NGC 2915 is considered as an extreme case of BCDs in the local universe since its neutral atomic hydrogen (HI) gas content is very high and extremely extended in distribution. Moreover, almost all the young stellar populations and regions of ionized atomic hydrogen (H II) are located near the center of this galaxy. In the present study, we investigate the triggering mechanism of the highly concentrated star formation in NGC 2915 using the Far/Near Ultra-Violet (FUV/NUV) observations since the ultraviolet continuum is considered to be a direct tracer of recent star formation in galaxies. We aim to analyze the star formation activity in NGC 2915 through the estimation of star formation rate (SFR). We further estimate the attenuation in UV and compute the extinction corrected SFR with the help of UV spectral slope.

2. **Name**: Shriranjani Sowmianarayanan
Registration Number: NS_110
Institution: CHRIST (Deemed To Be University), Bangalore
Type of Presentation: Oral
Title: Disk Variability Of Classical Be Stars Using Lamost Medium-Resolution Spectra
Abstract: Classical Be stars are non-supergiant spectral type B stars indicated by Balmer emission lines that originate from their circumstellar disk. This circumstellar disk is formed from the decretion of mass from the star due to rotational speeds close to its critical velocity. The dynamical perturbations in the decretion disk can be observed as variability in Hα strength and profiles using multi epoch medium-resolution spectra. CBe stars usually exhibit variability in the short term and in long term. Non-radial pulsation explains line profile variability on short term and binarity effects are found to be a source of intermediate period disk variability. The extreme case of such variability is the appearance/disappearance of the Hα emission line, indicative of the formation of a disk or disk-less state in CBe stars. We use a catalogue of 1162 candidate Be stars identified from LAMOST Medium-Resolution Spectra from LAMOST Data Release 7. We identified 25 variable Be stars, where 10 candidates show profile variability and 15 candidates show a change in Hα emission strength based on the multi-epoch data available for each star. Equivalent Widths and Full Widths at Half Maximum values were estimated for our sample of variable Be candidates. Results from the analyses will provide a reference for future investigations of the disk formation in the vicinity of the CBe stars, as well as a better understanding of the LPV and the significance of binarity in decoding the Be phenomenon.

3. **Name**: Sruthy K S
Registration Number: NS_111
Institution: Mahatma Gandhi University, Kottayam
Type of Presentation: Oral
Title: Thermodynamic Study Of Black Hole In Einstein-Cartan-Sciama-Kibble Gravity Surrounded By Quintessence Field
Abstract: The realisation of the fact that the four laws of black hole mechanics are identical to the four laws of thermodynamics spans the platform of black hole thermodynamics. In thermodynamic studies, we are mainly interested in the response of certain thermal quantities in the system to changes in temperature. Black hole thermodynamics is the area of study that seeks to reconcile the laws of thermodynamics.with the existence of black-hole event horizons. Black holes have often provided profound insights into the nature of gravity and the structure of space-time. The study of the thermodynamical properties of black holes is a major research theme in contemporary theoretical physics. Here we are discussing the thermodynamic studies in generalised Einstein-Cartan-Kibble-Sciama gravity on parameters like mass, temperature, specific

heat, Helmholtz free energy, enthalpy, and Gibbs' free energy, and a comparative study with quintessence on parameters like mass, temperature, and specific heat along with the state equation. Analyzing the thermodynamic conditions, heat capacity is derived with and without quintessence. Moreover, for some special cases, the thermodynamics are compared to those of Reissner-Nordstöm and Braneworld black holes. Subsequently, followed by the corrections in both logarithmic and quantum mechanical, using Bekenstein-Hawking area law and the Generalized Uncertainty Principle (GUP), additionally, mass and temperature variations with quintessence are plotted.

4. **Name**: Lakshmi K R
Registration Number: NS_113
Institution: –
Type of Presentation: Oral
Title: Investigation Of Static Stability Of Venusian Atmosphere Using Akatsuki Radio Occultation Data
Abstract: The present knowledge of the Venusian atmosphere is limited as its thick sulphuric acid clouds hinder space-borne exploration. In this scenario, Radio Occultation (RO) is a suitable method to probe the dense neutral atmosphere of Venus. The primary objective of this study was to use Venusian RO-derived atmospheric profiles to derive the atmospheric static stability, an important parameter determining vertical transport, stratification & convective activity. In this study, temperature, pressure and density profiles (∼40-90 km) from the Radio Science experiment on board JAXA's Akatsuki orbiter, along with the VIRA empirical model, were used to derive static stability profiles of the Venusian atmosphere. A Python-based algorithm was implemented to retrieve the static stability, incorporating temperature-varying specific heat capacity (Cp) for the extreme temperature-pressure conditions of Venus. Our analysis reveals that the atmosphere is predominantly stably stratified, with significant latitudinal variations in the stability profiles. While altitudes above $\sim$ 60 km were found to be stable at all latitudes, a distinct unstable region was observed around $\sim$ 50 km altitude (middle-cloud layer), whose vertical width varied strongly with latitude. The atmosphere below $\sim$ 47 km was found to be moderately stable in the lower latitudes, but unstable in the polar regions. The results of this work agree very well with the observations reported in previous studies of the Venusian atmosphere.

5. **Name**: Roshni M
Registration Number: NS_116
Institution: –
Type of Presentation: Oral
Title: Investigation On The Response Of Martian Upper Atmosphere To The Passage Of Interplanetary Coronal Mass Ejections
Abstract: The atmosphere of Mars is very thin compared to former time.It is believed that, due to continuous Solar activity the Martian atmosphere has escaped from its earlier position.Coronal Mass Ejections are eruptions from Sun's corona which are massive bursts of plasma and magnetic field. They propagate through interplanetary space and becomes Interplanetary Coronal Mass Ejections (ICME). The interaction of these high energetic particles with Martian atmosphere is different from that of Earth because of the absence of intrinsic global magnetic field in Mars. Mars Atmosphere and Volatile EvolutioN (MAVEN) spacecraft provides an opportunity to study the impact of these ejections on the atmosphere of Mars. The ICME events on 08 March 2015, 13 September 2017 and 27 August 2018 has been compared and studied using data pipelines developed in Python . Investigation using the data from Neutral Gas and Ion Mass Spectrometer and Langmuir Probes and Waves aboard MAVEN has showed a depletion of electron densities on the upper atmosphere of Mars during the ICME events. Electron temperature is found to be increased and ionosphere gets compressed during the event compared to the normal days. If the energy and velocity of those particles are higher, there will be a great impact on the atmosphere and more particles get ionized and escape from the atmosphere of Mars. This work points out the fact that interaction with ICMEs can be considered as one of the reason for atmospheric loss of Mars.

6. **Name**: Aiswarya V M
Registration Number: NS_120
Institution: Post Graduate Student
Type of Presentation: Oral
Title: Astrometry Of Selected Stars Using Data From Various Space Missions
Abstract: The present investigation entitled "Astrometry of Selected Stars using Data from Various Space Missions" is mainly focused on the astrometry of stars based on the data releases of the missions - Hipparcos and Gaia. We aim at calculating the distance and transverse velocity of 60 different stars. The error in the values are calculated and plotted using Python programme. The data for the calculation is taken from data releases of the space missions -Hipparcos, Gaia DR1, DR2 and EDR3 . The star data releases of these missions were collected from VizieR -the astronomical catalogue e-library. The interactive sky atlas ALADIN is also referred to obtain the images of stars. From the values and plots, a comparison in errors involved in space mission measurements is carried out. It can be seen that the values from Hipparcos are not as accurate as Gaia, in large distances (above 500 pc). At a distance of 0-100 pc, almost all the values of different missions are similar and contain only negligible errors. But when distance is increased the values of Hipparcos and GaiaDR1 data contain large errors. At larger distances Gaia EDR3 is found to be more accurate.

7. **Name**: Albin P James
Registration Number: NS_121
Institution: Project Student
Type of Presentation: Oral
Title: Statistical Properties Of Dark Matter Halos From Cosmological Simulations
Abstract: In the theory of cosmological structure formation, galaxies form in gravitationally bound dark matter clumps called dark matter halos. In this project, we investigate the statistical properties of dark matter halos using numerical simulations. In particular, we estimate the halo mass function, which is the number density of dark matter halo as a function of mass, for various redshifts and box sizes. Further, a counts-in-cells analysis for halo mass function was conducted for redshifts 0.2 and 3 by dividing the boxes into smaller boxes of 50, 25 and 20 MPc/h and measuring the variation of mass function across sub boxes.

8. **Name**: Pratyusha K P
Registration Number: NS_127
Institution: –
Type of Presentation: Oral
Title: Stellar Tidal Streams And Their Host Galaxy: A UVIT Study
Abstract: The interaction histories and the star formation properties of a galaxy can have major implications on the evolution of galaxies. During tidal gravitational interactions between galaxies, distortions are produced, which sometimes lead to the formation of spatially extended tidal streams in the halo surrounding galaxies. These interactions can also produce an increased, highly increased or reduced rate of star formation. The prime objective of this study was to investigate whether the presence of streams could impact the star formation in their host galaxy. Here, we focus on the galaxies NGC 7531, NGC 4651 and NGC 1097 which has undergone the effect of interaction in their lifetime and thereby with the presence of stellar stream association near them. In order to study the star formation in each of these galaxies, we utilized the Ultra-Violet Imaging Telescope (UVIT) onboard AstroSat, as its high resolution helps to resolve each star-forming knot separately. Thus, using the UVIT FUV images, the star forming regions were mapped, and their characteristics were studied. We found that asymmetry and instabilities exist in the star forming properties of galaxies NGC 7531, NGC 4651 and NGC 1097. Overall, the results of this study point to the role of tidal streams in shaping the evolutionary path of their host galaxy.

9. **Name**: Renjithmon A A
Registration Number: NS_130
Institution: MG University
Type of Presentation: Oral
Title: Gaia DR3 View On Gum 31
Abstract: The study aims to characterize the Gum 31 H II region located near Carina Nebula complex using Gaia DR3 astrometric data. The region reported to be associated with young stellar objects. We identified 96 young stellar objects near Gum 31 using the Spitzer data. The Gaia DR3 astrometric data and distances of the known YSOs are used to estimated the median distance and proper motion of the region. The distance of the region is estimated as 2626.52 $\pm$ 300 pc, which are consistent with previous studies. Using the estimated parameter, we identified the co-moving members of the Gum 31 region. We created the Gaia Color-Magnitude diagram of the members of the region. We will use the Gaia data to identify multiple populations, and test the cloud-cloud collision scenario for the formation of the region in the future.

10. **Name**: Akhila D
Registration Number: NS_131
Institution: M G University
Type of Presentation: Oral
Title: Identification And Classification Of Weakline T Tauri Stars Using Lamost DR6
Abstract: Strong emission lines define the T Tauri Stars, a subclass of Pre Main Sequence stars. Iron, Ca II, and hydrogen are the powerful emission lines found in their spectrum. T Tauri Stars are classified as weak line T Tauri stars and classical T Tauri Stars. Compared to classical T Tauri stars, weakline T Tauri stars have essentially no infrared excess. Weak line T Tauri Stars are more advanced T Tauri Stars and the majority of them have dispersing discs, which can be a planetary or debris disc. In this work, I am trying to identify and categorise Weak-line T Tauri stars identified from Large Sky Area Multi Object Fiber Spectroscopic Telescope Data Release 6 spectral survey. Through this work, we have identified 894 weakline T Tauri stars from LAMOST DR6 and have also separated 6331 of young main sequence stars from this possible weakline T Tauri star population. Further, we will be looking into the spectral features of this weakline T Tauri star population.

11. **Name**: Abirami M
Registration Number: NS_132
Institution: School Of Sciences, Jain (Deemed-To-Be University), Bengaluru
Type of Presentation: Oral
Title: Study Of Adaptability And Bio-Signatures Of Extremophiles In Celestial Bodies
Abstract: It is a widely accepted theory that liquid water, elements like carbon, oxygen, nitrogen along with supporting atmospheric and terrestrial conditions have led to the evolution of life on Earth. This perception was questioned when a new species of organisms was discovered by Prof. Tom Brock in the year 1964, which could withstand extreme high temperatures in natural springs of Yellowstone National Park. These were called Extremophiles. They are ecologically dominant and adaptable. Extremophiles have been known to thrive under extreme conditions like intense gravity, high radiation, extreme variation in temperature (thermophile/pyrophile/psychrophile), pressure, acidic medium (acidophiles), etc. We hypothesize a possibility of survival and evolution of extremophiles or similar organisms in celestial bodies like planets, comets, minor planets, exo-planets. The presence of such organisms on other celestial bodies can be observed through their bio-signature. By simulating these environments in laboratory conditions, we intend to understand how these organisms adapt, survive, evolve, and reproduce in these extreme conditions and analyse their bio-signatures to be observed in celestial bodies. We present the preliminary results of the ongoing study in this paper.

12. **Name**: Megha Das
Registration Number: NS_133
Institution: Visiting Research Scholar, Indian Institute Of Astrophysics, Bangalore
Type of Presentation: Oral
Title: Signatures Of Modified Kerr-Newman Black Holes From The Observed Quasi-Periodic Oscillations
Abstract: Black holes (BH) represent the end stages of the evolution of stars with ZAMS ¿ 15.0 $M_{\odot}$. These BHs are formed by the gravitational collapse of a massive star. BHs cannot be seen, but the effects of their strong gravity on the stars and the gases nearby can give us a lot of information. Astronomers' best hope has been to discover a BH in a nearby binary system. If the BH is in such a system, it will pull gas from the envelope of the normal companion star. The angular momentum of their orbital motion would cause a disk (accretion) of gas to form around the BH. As the gas spirals down toward the event horizon, it is compressed and heated up to millions of kelvins and emits X-rays from the innermost regions of the disk above the BH. In this study, various models that have been proposed in the literature are used to explain the observed QPO frequencies, which depend on the epicyclic motion of test particles and hence on the background metric (Modified Kerr-Newman). By performing a Chi-Square analysis between the theoretical and observed QPO frequencies, a conclusion has been reached that the Kerr BH in general relativity is more favored than BHs with charge parameters.

13. **Name**: Sidharth A V
Registration Number: NS_134
Institution: CHRIST (Deemed To Be University), Bangalore
Type of Presentation: Oral
Title: Lomb-Scargle Periodogram Analysis Of Classical Be Stars
Abstract: Classical Be stars (CBe) are non-supergiant spectral type B stars indicated by Balmer emission lines that originate from their circumstellar disk and show time variability in these spectroscopic features. This circumstellar disk is formed from the ejection or decretion of mass from the star due to rotational speeds close to its critical velocity. Be stars are known to show variability in their brightness and spectral features across a large range of timescales from hours to decades. Non-radial pulsation (NRP) explains significant line profile variability (LPV) on short-term, and binarity effects are found to be an important source of intermediate-period disk variability. Therefore by observing these variations, the associated timescales will give insight into the physical cause of these changes. Here we are doing the light curve(V mag) analysis on some CBe stars by using the data collected from the Himalayan Chandra Telescope (HCT) and the American association of variable star observers(AAVSO) database. We are implementing the Lomb–Scargle periodogram, an algorithm for detecting and characterizing periodic signals in unevenly sampled data. Results from these analyses will provide a reference for future investigations of the disc-formation of CBe stars, as well as a better understanding of the LPV and the significance of binarity in decoding the "Be phenomenon"

14. **Name**: Mamta Sunil Lad
Registration Number: NS_136
Institution: St. Xavier's (Autonomous) College, Mumbai
Type of Presentation: Oral
Title: Analysis Of Nearby Young Moving Groups (NYMGs) Using Gaia DR3
Abstract: Past few decades have seen a remarkable rise in the study of nearby moving groups due to renowned all sky surveys using facilities such as 2MASS, WISE and Gaia. These groups of stars are said to be remnants of star clusters and are believed to have a common origin. They share a similar space motion, which is used to identify their memberships. In our study we provide a comprehensive catalogue of nearby moving groups candidates within 150 pc, identified using Gaia DR3. We used BANYAN algorithm for membership analysis and high quality astrometric data from Gaia DR3.The unparalleled accuracy of Gaia DR3 astrometry makes our study more reliable when compared to previous studies. From our study, we identified 378 new moving group candidates and 194 new bonafide members. We analysed the galactic velocities of all the moving group candidates and checked the credibility of Good-box criterion which is widely used for identifying moving group stars. From our study we propose a refined 'good box' criterion with dimensions: U= -32.73 to -4.96,V= -32.28 to 2.61,W= -24.44 to 6.43. We used Gaia DR3 photometry to estimate stellar

parameters such as age and mass of the moving group members. Interestingly, we found that age spread is significantly wide among the moving group members, in spite of their common origin. The possibility of the presence of a remnant circumstellar disk around the moving group stars is also evaluated.

15. **Name**: Megha Madhusudhan
Registration Number: NS_137
Institution: Manipal Centre For Natural Sciences, Manipal Academy Of Higher Education
Type of Presentation: Oral
Title: Tidal Disruption Events And Their Host Galaxies
Abstract: With the advent of time-domain astronomy, brilliant transients have been discovered near the centres of the galaxies. Most of them are brighter than canonical supernovae and exhibit long-lasting light curves with almost featureless spectra at the early stages of their evolutions. They are spatially unresolved from their host centres. Some of them are supposed to be disruptions of solar mass stars by supermassive black holes located at the centres of their host galaxies. These are commonly known as Tidal Disruption Events (TDEs). About 100 such TDEs (or TDE-like events) have been discovered so far. Observationally it has been found that TDEs are hosted mainly by galaxies that have old stellar populations. However, this may also be an observational bias. Here we will briefly discuss the observational signatures of Tidal Disruption Events. We will also present the bulk spectroscopic properties of the hosts of these cosmic catastrophes.

16. **Name**: Juris N J
Registration Number: NS_138
Institution: St.Thomas College, Ranni
Type of Presentation: Oral
Title: Timing Analysis Of Thermonuclear X-Ray Burst From 4U 1636-536
Abstract: This project aims at the study of thermonuclear bursts from low-mass X-ray binary 4U 1636-536. A thermonuclear X-ray burst (or type-I X-ray burst) is a quick, intense flash of X-ray emission from LMXBs. The atoll source 4U 1636- 536 was successfully analysed by using the AstroSat/LAXPC data for observations on 6 and 18 August 2018. Background subtracted light curves in the energy range 3 to 80keV is created for both observations. They showed thermonuclear X-ray bursts. Dips were shown by the August 18 observation. A total of 14 bursts and two dips were observed. The second burst B2 has the highest count rate of $\sim$3076 counts/sec. Dips have approximately 3 seconds of exposure time. Various burst profiles are created for different energy ranges for studying the dependence of burst intensity on the energy ranges. It is found that for all the burst profiles, the burst intensity is maximum at 3-6 keV and keeps decreasing with an increase in energy. The bursts property is distinguishable only up to 21 keV energy. The burst-like events are fitted using the model BURS. The decay time of the burst profiles is seen to decrease with an increase in energy. The color-color diagram and the Hardness-Intensity diagram are created and it is found that these observations belong to the hard spectral state of the source. The Hardness Ratio of two light curves in different energy bands is plotted with time on the X-axis. An increase in the hardness ratio is seen during the occurrence of bursts.

17. **Name**: Jowhara Jafar
Registration Number: NS_140
Institution: Farook College (Autonomous), University Of Calicut
Type of Presentation: Oral
Title: Fermi/Lat Observations Of Enhanced Gamma Ray Flare From 3C 345 During September 2022
Abstract: We conducted a detailed temporal study of an enhanced gamma-ray flare from the flat spectrum radio quasar 3C 345 during September 2022(MJD 59818-59847) using the Fermi/LAT observations. The half day bin -ray lightcurve in the energy range of 0.1300 GeV shows three flares with one major flare of 10 times enhancement of flux. The highest flux measured is (3.83$\pm$0.26)x10-6 ph cm2 s1 considering the base flux of 1.77x10-7 ph cm2 s1 calculated by averaging the flux points when the source was in quiescent state. In this work we find the hardening and softening of the flares and compare it with the previous flares.

18. **Name**: Aiswarya Sankar.K
Registration Number: NS_102
Institution: Msc Physics Nirmalagiri College Koothuparamba Kannur Kerala
Type of Presentation: Poster
Title: SED Fitting Analysis Of S284
Abstract: Spectral energy distribution curve analysis by using the software SEDBYS and gitlab. It is a computational work. This curve which is similar to a black body curve would help to understand the properties of a star like young stellar object. So it is helpful in analysing protostar and T Tauri stars.

19. **Name**: Moumita Das
Registration Number: NS_105
Institution: The University Of Burdwan
Type of Presentation: Poster
Title: Behaviours Of Radio Sources: Brief Study Of Few Observables
Abstract: Different data sources of redshifts among 0.01001 to 0.02 are studied. Sloan Digital Sky Surveys (SDSS) has released some data publicly among them the most recent data release (DR17) is available on 6th December, 2021. There is nothing to mark on extra that these are very recent time phenomena. Dust Attenuations of these objects are staying near a straight line passing between 0 and 1. At Least for the sources studied, the dust extinctions stay lower than the numerical value 2.9. Some data show moderately high star formation rates. The line ratio calibration is O[III]N[II] which indicates the metallicity. The Dn (4000) index is an excellent age indicator for young [Dn (4000) ¡1.5] stellar populations, but for older stellar populations [Dn (4000) ¿1.6], the index depends quite strongly on metallicity. Dn 4000 is found to raise gradually with increasing redshift. We expect to find more deeper aspects as the data points are increased. Results are physically interpreted.

20. **Name**: Meenu G
Registration Number: NS_109
Institution: University Of Kerala Kariavattom Campus, Trivandrum
Type of Presentation: Poster
Title: Solar Wind Variability On Lunar Surface Compared To Near Earth Environment: Intriguing Aspects
Abstract: Background: The solar wind is a continuous stream of charged particles like electrons and protons, alpha particles, and trace heavy ions with energies up to approx. 10MeV that are emitted constantly from the Sun's corona that will flows out of the Sun in all direction. The variability of the solar wind speed on the lunar surface in comparison with the near Earth environment is analysed for the first time in the present study. Further, quantified variability in solar wind speed on the lunar surface . The study uses the solar wind observation on the lunar surface from Apollo satellites and in the near-Earth Environment observations from multi satellites. The F10.7 index is taken as a proxy for solar activity. The study period is from 1970 to 1976, which encompasses the high, moderate and low solar activity conditions. The variations in the solar wind speed in the lunar surface and near-Earth environment is compared and the change is quantitatively deducted for the different solar activity conditions. Results: The study reveals that the solar wind velocity varies as it approaches the lunar surface compared to the near-Earth environment. In 1970 (F10.7 =169.8), the change in solar wind velocity at the lunar surface was 37 km/s and was increased to 70 km/s in 1976 (F10.7 =169.8) This relation is inverse in nature. Further, the magnitudes of solar wind velocity at the lunar surface as well as at near Earth environment are inversely linked with the activity of the sun.

21. **Name**: Jawahar Raja P
Registration Number: NS_112
Institution: Dr. N. G. P Arts And Science College & Indian Institute Of Astrophysics
Type of Presentation: Poster
Title: Determination Of Filament Counts Using Hydrogen - Alpha Images Of The Sun
Abstract: Filaments are essentially prominences seen as absorbing features on the disk of the Sun. Thus, from observations of Filaments taken at Kodaikanal Solar Observatory-Indian Institute of Astrophysics using H Alpha Telescope the distribution of Filaments over the whole disk. image can be studied. For the Solar

Cycles 18,19,20 and 21 the Number of Filaments appeared on the Sun is Counted by using Sunspot, Faculae and Prominence Charts available at IIA's Data Archive, I have used 16789 days of data into the analysis. This covers about 50 years. The obtained data are plotted and studied the cyclic behavior of the Filaments appearance on the Sun.

22. **Name**: Aswin Amirtha Raj S
Registration Number: NS_115
Institution: Internship Student At Arul Anandar College
Type of Presentation: Poster
Title: Coronal Holes And Their Effects On Sunspot And Other Solar Activities
Abstract: The coronal holes are predominantly found in the higher latitude regions (Polar Regions), but we can also find their presence in the lower latitudes. Many studies had done on low-latitude coronal holes and their interaction with the CMEs. In our work, we try to find out the low latitude coronal hole interaction with the sunspot and the effects of open field lines of such coronal holes on the activity and lifetime of the sunspot. For that, we filtered out the sunspot having the coronal holes nearby and we are going to study their characters in detail using the SHARP parameters. As a secondary goal, we will find out whether there are any discrepancies in the flare and CME onset when the coronal holes are nearer to the sunspots. Since the coronal hole's fast solar wind has the capacity to change the CME structure and direction, we expect these coronal holes can introduce some instability in the loops of the sunspot which may lead to a change in the lifetime and activity of the sunspots.

23. **Name**: Andriya Zenith C P
Registration Number: NS_118
Institution: CHRIST (Deemed To Be University), Bangalore
Type of Presentation: Poster
Title: Role Of Computational Astronomy In Calculating Dynamics Of The Celestial Objects
Abstract: Observational Astronomy is the study of celestial objects in the universe beyond Earth. This research builds an AstroCalc website for calculating celestial objects' dynamics, primarily focusing on estimating the Julian Date, which is the continuous count of days since the beginning of the Julian period. It also calculates the rising and setting of sidereal rate objects. Also, to finally visualize the celestial objects through a sky map. This work can benefit professional astronomers, amateurs and space enthusiasts to quickly calculate elapsed days between two events and easily point a telescope to the proper coordinates in the night sky. This research is a small step towards achieving the bigger goal for the ephemeris calculations with integrated visualizations. Further can be progressed towards app development.

24. **Name**: Sabnam Parvin
Registration Number: NS_119
Institution: Jadavpur University
Type of Presentation: Poster
Title: Motion Of Massive And Massless Test Particles Around A Classical Black Holes
Abstract: In my present project work , i review the behaviour of massive and massless test particles around asymptotically flat and spherically symmetric , charged brane world black holes. Several physical nature of charged brane -world black holes have been investigated. At first, time-like and null geodesic of charge brane -world black holes are presented. We also analyze all the possible motions by plotting the effective potentials for various parameters for circular and radial geodesic. Secondly, we investigate all the possible motions by calculating and plotting the corresponding effective potential for the massless and massive particles as well by using Hamilton-Jacobi(H-J) formalism. Further the motion of massive (charged or uncharged) test particles in the gravitational frid and examine it's behaviour both in static and non-static case.

25. **Name**: Sanjay B
Registration Number: NS_122
Institution: CHRIST (Deemed To Be University), Bangalore
Type of Presentation: Poster
Title: Finding Features In Galaxy Images
Abstract: Galaxy morphology is a system used for classifying galaxies based on its structural properties. In this work, we identify and understand certain kinds of morphological features in galaxies. We study these features and correlate them with other properties of the galaxies and their environment which helps us in understanding the formation and evolution of galaxies and clusters. The data used for the analysis of features in the galaxy images are from Subaru HSC survey which consists of Galaxies discovered by three-layered, multi-band (grizy plus 4 narrow-band filters) imaging survey with the Hyper Suprime-Cam (HSC) on the 8.2m Subaru Telescope. The collective data release includes over 1400 square degrees of the sky. We have looked into 625 galaxy images and the database is regularly added with new galaxy images. If there is no defined feature for a galaxy, we list it into an unlisted feature. Our results have identified 200 images of galaxy clusters which also include interacting galaxies and 100 galaxy images based on its structure. The remaining galaxies were either classified as smooth or unlisted. This work was done as a part of the citizen science project organised by Pune knowledge cluster.

26. **Name**: Aditya Das
Registration Number: NS_123
Institution: Jadavpur University
Type of Presentation: Poster
Title: Cosmological Solution For F(R) Gravity Theory With Perfect Fluid Having Variable Equation Of State
Abstract: At first I derived the expression of Einstein's field equation for the modified gravity theory i.e. for the f(R) gravity theory by choosing the appropriate Lagrangian and used action principle to get the Einstein's field equations for the modified gravity theory. I derived both the vacuum Einstein equation and the curvature energy-momentum tensor, sourcing the effective Einstein equations for the space-time. Then I took the FLRW metric and find out the values of the metric tensor, Christoffel symbols, Ricci tensor and curvature tensors respectively. Form these I got the non-vanishing components of the Einstein tensor. Then considering the cosmic fluid to be the perfect fluid in nature, and due to the cosmological principle, Weyl postulate and Einstein's general theory of relativity, I considered the four velocity components with time-like nature and taking the energy-momentum tensor I find out the non-vanishing components of the energy-momentum tensor. Form there I considered the conservation of the energy-momentum tensor, which gives four relation (equation) corresponding to the set of choice of coordinates. I find out the explicit form of it. Now note that we also have the equation of state of the perfect fluid. Now I derived the Friedmann's equations for the f(R) gravity theory. Form the equations mentioned above we can find out the cosmological Solution for f(R) gravity theory with perfect fluid having variable equation of state.

27. **Name**: Amrutha S
Registration Number: NS_125
Institution: Research Scholar
Type of Presentation: Poster
Title: Dependency Of Magnetospheric Parameter Dst On Interplanetary Magnetic Field (Imf Bz) And Its Seasonal Variations During 22nd Solar Cycle For Major And Minor Storms
Abstract: In the present study, we have selected events of major and minor geomagnetic disturbances during 22nd solar cycle (1986-1996), and the interdependencies of magnetospheric parameter Dst on Interplanetary Magnetic Field (IMF Bz), were studied. For each geomagnetic storm, the time series of solar wind parameter IMF Bz and magnetospheric index Dst were analyzed for obtaining the possible coupling between solar wind and magnetosphere during geomagnetic storm, using correlation analysis. In addition to this, the seasonal variabilities of the occurrence of storms were also studied by estimating the monthly occurrence of storms during the period. In this study, the storms, with maximum value of Dst ¡-100nT were categorized as major storms and those satisfying the condition Dst¿-100nT were termed as minor storms, and the data were obtained from OMNI WEB data (https.omniweb.gsfc.nasa.gov). From the time series analysis of Dst

and IMF Bz, a strong direct dependence between these parameters were observed Also, it was reported that the magnitude of negative IMF Bz is larger in high solar active period than low solar active period. Likewise, the solar wind speed is faster in high solar active period than in low active period. The seasonal variations of magnetospheric parameter Dst with solar wind parameter IMF Bz for major storms and minor storms exhibit a strong equatorial asymmetry between Spring equinox and Autumn equinox.

28. **Name**: Vidyasagar Bhat
Registration Number: NS_128
Institution: Jain (Deemed To Be) Unversity
Type of Presentation: Poster
Title: Study Of Tidal Interactions In Interacting Galaxies Through Data From New-Age Instruments
Abstract: Every part of our observable Universe is populated with hundreds of galaxies. Nearly all of these galaxies ranging from faint dwarfs to those that shine only in X rays to those with beautiful spiral shaped giants, seems to have formed after the universe began, and they pervade space, even into the depths of the farthest reaches penetrated by powerful modern telescopes. Most galaxies are well separated in space, but often than thought tend to interact with each other either physically or gravitationally. This is called a tidal interaction because of which the presence of one galaxy can influence the other galaxy in its neighborhood to the extent that it could distort the shape of first galaxy itself. Because tidal effects are strongest in the immediate vicinity of a galaxy, dwarf or satellite galaxies are particularly likely to be affected. There are numerous interacting galaxies which are observed in the Universe. Such interacting galaxies in different phases are studied using photometric and spectroscopic data to understand the influence of the tidal interactions on the morphology, chemical composition, star formation etc in them. We intend to make use of latest observational data from facilities like Hubble Space Telescope, James Web Space Telescope, Sloan Digital Sky Survey to explore the tidal interactions between interacting/ colliding galaxies.

29. **Name**: Riya Fathima K K
Registration Number: NS_139
Institution: Mahathma Gandhi University
Type of Presentation: Poster
Title: Timing Analysis Of Thermonuclear X-Ray Burst Of Atoll Source 4U 1636-536
Abstract: In this work we analysed the timing analysis of thermonuclear X-ray bursts from the LMXB 4U 1636-536 using AstroSat/LAXPC data for observations on 02th February and 09th May 2018. For the two observations background subtracted light curve in the energy range of 3 to 80 keV is created. Only one thermonuclear X-ray burst is observed with a count rate of $\sim$946 counts/sec. A total of 7 dips with approximately 3 seconds of exposure time is observed. For the purpose of examining how burst intensity varies with energy ranges, various burst profiles are created. It is discovered that for all burst profiles, the burst intensity peaks at 3-6 keV and gradually decreases as the energy level rises. The bursts like events are observed only up to 21 keV energy. The model BURS is used to fit the burst-like events. The decay time of the burst profiles is seen to decrease with an increase in energy. These observations are found to belong to the hard spectral state of the source according to the color-color diagram and the hardness-intensity diagram that are created.