

*Add on course*

# Introduction to Astronomy

2022- 23

## Syllabus

**Course Duration 30 hours**

### Introduction to Astronomy

Introduction to Astronomy provides a quantitative introduction to the physics of the solar system, stars, the interstellar medium, the galaxy, and the universe, as determined from a variety of astronomical observations and models.

#### **Unit 1: Introduction to Astronomy and Astrophysics**

Astronomy Basics , Exploring Space , Earth Rotation - Sky coordinates - seasons - phases of the Moon - the Moon's orbit and eclipses, Planetary motions - Kepler's Laws - Gravity; Light & Energy - Telescopes Optics - Detectors; Planets: Formation of Solar System - planet types - planet atmospheres - extrasolar planets; Stars: Measuring stellar - HR diagram - stellar structure (equilibrium, nuclear reactions, energy transport) - stellar evolution; Galaxies: Our Milky Way - Galactic structure - Galactic rotation - Galaxy types - Galaxy formation; Cosmology: Expansion of the Universe - redshifts - supernovae - the Big Bang - history of the Universe - fate of the Universe., Our Sun , Solar System Overview : The Terrestrial Planets (Mercury, Venus, Earth, Mars) , Outer, Dwarf and Exoplanets (Jupiter, Saturn, Uranus, Neptune), Plutoids, The Moons , Rocks and Ice Asteroids , Comets , Meteors , The Stars , Galaxies , The Universe, Early Space Exploration , Manned Exploration , History of Space

#### **Unit 2: Structure and evolution of stars**

Introduction, Classification of Stars: The Harvard classification, Hertzsprung – Russel diagram, Stellar evolution, White dwarfs, Electrons in a white dwarf star, Chandrasekhar limit, Neutron stars, Black holes, Supernova explosion, Photon diffusion time, Gravitational potential energy of a star, Internal temperature of a star, Internal pressure of a star.

### **Unit 3: Galaxies**

Classification of galaxies – contents and dimensions – collisionless stellar dynamics – relaxation time, dynamical friction, violent relaxation – galactic potential and orbits – spiral density wave and Lindblad resonance – rotation curves – Tully-Fisher relation – Central Black Holes and fundamental plane relationship – Mass and Luminosity function – Press Schechter formalism – Star formation history and chemical evolution – active galaxies and activity duty cycle – galaxies at high redshift - clusters and groups – evidence of dark matter.

Enrollment List Of students 2022 – 23 : Introduction To Astronomy

Sl No:	Candidate Code	Name of the student
1	23521118001	ABHIMANYU H
2	23521118002	ABHINAV V R
3	23521118003	ABHIRAMY B.R
4	23521118004	ANANDHU.A.B
5	23521118005	ANANTHU UNNITHAN
6	23521118006	ANASWARA. P.S
7	23521118007	ANJALI KRISHNA. K. M
8	23521118008	ANUJITH RAM
9	23521118009	ARATHY. S
10	23521118010	ASWATHY V. R
11	23521118011	BHAGYALEKSHMI R
12	23521118012	DEVENDU S N
13	23521118013	GANGA R.
14	23521118014	MEENU P.S.
15	23521118015	MITHUN G.M
16	23521118016	NEHA. SN
17	23521118017	PRAVEEN G
18	23521118018	RENJITH R S
19	23521118019	SIVANANDA M
20	23521118020	SIVARENJANA R S
21	23521118021	SIYA S NAIR
22	23521118022	SOORAJ S S
23	23521118023	SRAVYA S. S.
24	23521118024	SREELAKSHMI . B . J
25	23521118025	SREELAL. L S
26	23521118026	ABHILASH J
27	23521118027	ABHINAV S
28	23521118028	ABIN DAS M B
29	23521118029	ADITHYA L.R.
30	23521118030	AKHILA B
31	23521118031	AMRITHA RANI, P.K
32	23521118032	ANANTHAKRISHNAN A
33	23521118033	ARDRA.G
34	23521118034	ASWATHY S NAIR
35	23521118035	B S ADIDEV
36	23521118036	DEVIKA B V
37	23521118037	DEVIPRIYA.R
38	23521118038	GOURINANDA K A

39	23521118039	KAVYA J
40	23521118040	KRISHNENDU S
41	23521118041	LEKSHMY P
42	23521118042	MEGHA MANOJ R
43	23521118043	NANDHANA S R
44	23521118044	PRANAV R B
45	23521118045	ROHITH S S
46	23521118046	SABARINATH S P
47	23521118047	SREERAG S
48	23521118048	ADHITHYA KRISHNAN A
49	23521118049	ANOOP S
50	23521118050	ASWATHY KRISHNAN
51	23521118051	ATHIRA R S
52	23521118052	G A GOPIKRISHNAN
53	23521118053	JAGANNATH S
54	23521118054	VYSHNAVI V S
55	23521118055	GOKUL KUMAR A G
56	22021118001	ADWAITH. J.S
57	22021118002	AKHIL S S
58	22021118003	AKSHAY. A
59	22021118004	AMRUTHENDU M
60	22021118005	ANASWARA.P
61	22021118006	ARATHY R
62	22021118007	ARSHA PRASAD N
63	22021118008	ASWANI A.S
64	22021118009	B AMAL BHASKAR
65	22021118010	GOWTHAM SANKAR S
66	22021118011	HARIKRISHNAN D
67	22021118012	NANDANA MUKUNDAN
68	22021118013	NANDU G.P
69	22021118014	NEETHU S
70	22021118015	NIDHUN S R
71	22021118016	RITHIN P
72	22021118017	SANUSH .S
73	22021118018	SARAN PRASAD V
74	22021118019	SREELEKSHMI S S
75	22021118020	VAISHNAV. I
76	22021118021	VISHNU V. S
77	22021118022	ABHIJITH D
78	22021118023	ADARSH RAGHAVAN
79	22021118024	ADITHYA M R
80	22021118025	AFRAN S
81	22021118026	AMAL KRISHNA M
82	22021118027	AMALA UNNI B S

83	22021118028	AMALU AJAY
84	22021118029	ANAND SHAJI
85	22021118030	ANANTHA KRISHNAN
86	22021118031	ANUPAMA R.NAIR
87	22021118032	ASWANI A L
88	22021118033	DEVI NANDANA .P.S
89	22021118034	DHANUSH J
90	22021118035	GAYATHRY P V
91	22021118036	GOPIKA G
92	22021118037	GOURI
93	22021118038	HARI MURALI
94	22021118039	JOBITHA MOL J J
95	22021118040	M S ATHUL
96	22021118042	SANGEETH KRISHNA. S. R
97	22021118043	SANKAR GANESH
98	22021118045	NAVEENA V

Attendance		Nov							Dec		
Candidate Code	Name of the student	6	7	16	5	16	24	31			
23521118001	ABHIMANYU H	1	1	1	1	2	1	1			
23521118002	ABHINAV V R	a	1	1	1	1	1	1			
23521118003	ABHIRAMY B.R	1	1	1	1	1	1	1			
23521118004	ANANDHU.A.B	1	1	1	1	1	1	1			
23521118005	ANANTHU UNNITHAN	1	1	1	a	1	1	1			
23521118006	ANASWARA. P.S	1	1	1	1	1	a	1			
23521118007	ANJALI KRISHNA. K. M	1	1	1	1	1	1	1			
23521118008	ANUJITH RAM	1	1	1	1	1	1	1			
23521118009	ARATHY. S	a	1	1	1	1	1	1			
23521118010	ASWATHY V. R	1	1	1	1	1	1	1	a		
23521118011	BHAGYALEKSHMI R	1	1	1	1	1	1	1			
23521118012	DEVENDU S N	1	1	a	1	1	1	1			
23521118013	GANGA R.	1	1	1	1	1	1	1			
23521118014	MEENU P.S.	1	1	1	1	1	1	1			
23521118015	MITHUN G.M	1	1	1	1	1	1	1			
23521118016	NEHA. SN	1	1	1	1	1	1	1			
23521118017	PRAVEEN G	a	1	1	1	1	1	1			
23521118018	RENJITH R S	1	1	a	1	1	1	1			
23521118019	SIVANANDA M	1	1	1	1	1	1	1	a		
23521118020	SIVARENJANA R S	1	1	1	1	1	1	1			
23521118021	SIYA S NAIR	1	1	1	1	1	a	1			
23521118022	SOORAJ S S	1	1	a	1	1	1	1			
23521118023	SRAVYA S. S.	1	1	1	1	a	a	1			
23521118024	SREELAKSHMI. B. J	1	1	1	1	1	1	a			
23521118025	SREELAL. L S	1	1	a	1	1	1	1			
23521118026	ABHILASH J	1	1	1	1	1	a	1			
23521118027	ABHINAV S	1	1	1	1	1	1	1			
23521118028	ABIN DAS M B	1	1	a	1	1	1	1			
23521118029	ADITHYA L.R.	1	1	1	1	1	1	1			
23521118030	AKHILA B	1	1	1	1	a	1	1			
23521118031	AMRITHA RANI. P.K	1	1	1	1	1	1	1			
23521118032	ANANTHAKRISHNAN A	1	1	1	1	1	1	1			
23521118033	ARDRA.G	1	a	1	1	1	1	1			
23521118034	ASWATHY S NAIR	1	1	1	1	1	1	1			
23521118035	B S ADIDEV	1	1	1	1	1	1	1			
23521118036	DEVIKA B V	1	1	1	a	1	1	1			
23521118037	DEVIPRIYA.R	1	a	1	1	1	1	1			

23521118038	GOURINANDA K A	
23521118039	KAVYA J	
23521118040	KRISHNENDU S	
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23521118053	JAGANNATH S	
23521118054	VYSHNAVI V S	
23521118055	GOKUL KUMAR A G	
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22021118003	AKSHAY. A	
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22021118022	ABHIJITH D	
22021118023	ADARSH RAGHAVAN	
22021118024	ADITHYA M R	



22021118025	AFRAN S								a
22021118026	AMAL KRISHNA M								
22021118027	AMALA UNNI B S								a
22021118028	AMALU AJAY								
22021118029	ANAND SHAJI								a
22021118030	ANANTHA KRISHNAN								
22021118031	ANUPAMA R.NAIR								
22021118032	ASWANI A L								a
22021118033	DEVI NANDANA .P.S								a
22021118034	DHANUSH J								
22021118035	GAYATHRY P V				a	a			
22021118036	GOPIKA G								
22021118037	GOURI								
22021118038	HARI MURALI								
22021118039	JOBITHA MOL J J	a					a		
22021118040	M S ATHUL				a				
22021118042	SANGEETH KRISHNA. S. R								
22021118043	SANKAR GANESH								
22021118045	NAVEENA V		a						

*Padma*  
 Dr. P. PADMA KUMAR H  
 MAHATMA GANDHI COLLEGE  
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**Dr. PADMA KUMAR H**  
 Associate Professor  
 Department of Physics  
 Mahatma Gandhi College  
 Thiruvananthapuram-695004

- (a) Equator
  - (b) Tropic of Cancer
  - (c) South Pole
  - (d) North Pole
4. One Astronomical Unit is the average distance between
- (a) Earth and the Sun
  - (b) Earth and the Moon
  - (c) Jupiter and the Sun
  - (d) Pluto and the Sun
5. Who speculated that our universe is expanding?
- (a) Newton
  - (b) Edwin Hubble
  - (c) Galileo
  - (d) Copernicus
6. Who speculated that our universe is expanding?
- (a) Newton
  - (b) Edwin Hubble
  - (c) Galileo
  - (d) Copernicus
7. Who speculated that our universe is expanding?
- (a) Newton
  - (b) Edwin Hubble

(c) Galileo

(d) Copernicus

8. Who speculated that our universe is expanding?

(a) Newton

(b) Edwin Hubble

(c) Galileo

(d) Copernicus

9. The unit of measuring distances between the stars is known as

A) Light year

B) Stellar mile

C) Cosmic kilometre

D) Galactic unit

10. On which of the following planets of the solar system does the sun rise in the

west and set in the east?

A) Saturn

B) Mars

C) Jupiter

D) Venus

## Introduction To Astronomy

Candidate Code	Name of the student	Marks(20)	
23521118001	ABHIMANYU H	20	Abhimanyu
23521118002	ABHINAV V R	18	Abhinav
23521118003	ABHIRAMY B.R	19	Abhiramy
23521118004	ANANDHU.A.B	17	Anandhu
23521118005	ANANTHU UNNITHAN	18	Ananthu
23521118006	ANASWARA. P.S	19	Anasara
23521118007	ANJALI KRISHNA. K. M	15	Anjali
23521118008	ANUJITH RAM	16	Anujith
23521118009	ARATHY. S	18	Arathy
23521118010	ASWATHY V. R	19	Aswathy
23521118011	BHAGYALEKSHMI R	18	Bhagya
23521118012	DEVENDU S N	17	Devendulal
23521118013	GANGA R.	18	Ganga
23521118014	MEENU P.S.	19	Meenu
23521118015	MITHUN G.M	20	Mithun
23521118016	NEHA. SN	20	Neha
23521118017	PRAVEEN G	20	Praveen
23521118018	RENJITH R S	18	Renjith
23521118019	SIVANANDA M	19	Sivananda
23521118020	SIVARENJANA R S	18	Sivarenja
23521118021	SIYA S NAIR	17	Siya
23521118022	SOORAJ S S	18	Sooraj
23521118023	SRAVYA S. S.	19	Sravya
23521118024	SREELAKSHMI. B . J	18	Sreelakshmi
23521118025	SREELAL. L S	17	Sreelal
23521118026	ABHILASH J	19	Abhilash
23521118027	ABHINAV S	20	Abhinav
23521118028	ABIN DAS M B	20	Abin Das
23521118029	ADITHYA L.R.	20	Adithya
23521118030	AKHILA B	20	Akhila
23521118031	AMRITHA RANI. P.K	18	Amritha
23521118032	ANANTHAKRISHNAN A	19	Anantha
23521118033	ARDRA.G	17	Ardra
23521118034	ASWATHY S NAIR	18	Aswathy
23521118035	B S ADIDEV	19	Adidev
23521118036	DEVIKA B V	18	Devika

23521118037	DEVIPRIYA.R	20	Devipriya
23521118038	GOURINANDA K A	20	Gourinanda
23521118039	KAVYA J	20	Kavya J
23521118040	KRISHNENDU S	20	Krishnendu S
23521118041	LEKSHMY P	17	Lekshmy P
23521118042	MEGHA MANOJ R	18	Megha
23521118043	NANDHANA S R	19	Nandana
23521118044	PRANAV R B	17	Pranav
23521118045	ROHITH S S	18	Rohith S S
23521118046	SABARINATH S P	19	Sabarath
23521118047	SREERAG S	20	Sreerag S
23521118048	ADHITHYA KRISHNAN A	20	Adithya Krishnan
23521118049	ANOOP S	18	Anoop S
23521118050	ASWATHY KRISHNAN	18	Aswathy
23521118051	ATHIRA R S	17	Athira R S
23521118052	G A GOPIKRISHNAN	17	Gopikrishnan
23521118053	JAGANNATH S	18	Jagannath S
23521118054	VYSHNAVI V S	19	Vishnavi
23521118055	GOKUL KUMAR A G	17	Gokul
22021118001	ADWAITH. J.S	18	Adwaith
22021118002	AKHIL S S	15	Akhil S S
22021118003	AKSHAY. A	16	Akshay
22021118004	AMRUTHENDU M	14	Amruthendu
22021118005	ANASWARA.P	15	Anaswar P
22021118006	ARATHY R	16	Arathy R
22021118007	ARSHA PRASAD N	18	Arsha
22021118008	ASWANI A.S	19	Aswani S
22021118009	B AMAL BHASKAR	14	B Amal Bhaskar
22021118010	GOWTHAM SANKAR S	18	Gowtham Sankar S
22021118011	HARIKRISHNAN D	19	Harikrishnan
22021118012	NANDANA MUKUNDAN	20	Nandana Mukundan
22021118013	NANDU G.P	15	Nandu G P
22021118014	NEETHU S	20	Neethu S
22021118015	NIDHUN S R	20	Nidhun
22021118016	RITHIN P	18	Rithin P
22021118017	SANUSH .S	17	Sanush
22021118018	SARAN PRASAD V	18	Saran
22021118019	SREELEKSHMI S S	19	Sreelekshmi
22021118020	VAISHNAV. I	20	Vaishnav I
22021118021	VISHNU V. S	20	Vishnu
22021118022	ABHIJITH D	20	Abhijith
22021118023	ADARSH RAGHAVAN	18	Adarsh
22021118024	ADITHYA M R	19	Adithya M R
22021118025	AFRAN S	18	Afran

22021118026	AMAL KRISHNA M	17	<i>Amal</i>
22021118027	AMALA UNNI B S	18	<i>Amala</i>
22021118028	AMALU AJAY	19	<i>Amal</i>
22021118029	ANAND SHAJI	16	<i>Anand</i>
22021118030	ANANTHA KRISHNAN	18	<i>Anantha</i>
22021118031	ANUPAMA R.NAIR	19	<i>Anupama</i>
22021118032	ASWANI A L	16	<i>Aswani</i>
22021118033	DEVI NANDANA .P.S	18	<i>Devi</i>
22021118034	DHANUSH J	19	<i>Dhanush</i>
22021118035	GAYATHRY P V	18	<i>Gayathri</i>
22021118036	GOPIKA G	17	<i>Gopika</i>
22021118037	GOURI	17	<i>Gouri</i>
22021118038	HARI MURALI	17	<i>Hari</i>
22021118039	JOBITHA MOL J J	19	<i>Jobitha</i>
22021118040	M S ATHUL	18	<i>Ms</i>
22021118042	SANGEETH KRISHNA. S. R	18	<i>Sangeetha</i>
22021118043	SANKAR GANESH	20	<i>Sankar</i>
22021118045	NAVEENA V	20	<i>Naveena</i>

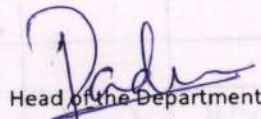
*Padma*  
**HEAD**  
DEPARTMENT OF PHYSICS  
M. J. SOFIA COLLEGE  
TRICHUR

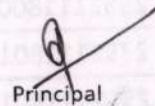
**DEPARTMENT OF PHYSICS**  
**MAHATMA GANDHI COLLEGE, THIRUVANANTHAPURAM**

**CERTIFICATE**


It is certified that Mr./Ms. M. Manu P.S..... has participated in  
the Add-on course on *Introduction to Astronomy* conducted by this department during 2022-2023.

  
Coordinator

  
Head of the Department

  
Principal

**Dr. PADMA KUMAR H**  
Associate Professor  
Department of Physics  
Mahatma Gandhi College  
Thiruvananthapuram-695004

  
**HEAD**  
DEPARTMENT OF PHYSICS  
MAHATMA GANDHI COLLEGE  
THIRUVANANTHAPURAM


## Feedback Analysis

Candidate Code	Name of the student	Excellent	Very Good	Good	Satisfactory	poor
23521118001	ABHIMANYU H	✓				
23521118002	ABHINAV V R		✓			
23521118003	ABHIRAMY B.R	✓				
23521118004	ANANDHU.A.B					
23521118005	ANANTHU UNNITHAN	✓				
23521118006	ANASWARA. P.S	✓				
23521118007	ANJALI KRISHNA		✓			
23521118008	ANUJITH RAM		✓			
23521118009	ARATHY. S		✓			
23521118010	ASWATHY V. R		✓			
23521118011	BHAGYALEKSHMI R	✓				
23521118012	DEVENDU S N			✓		
23521118013	GANGA R.			✓		
23521118014	MEENU P.S.		✓			
23521118015	MITHUN G.M		✓			
23521118016	NEHA. SN	✓				
23521118017	PRAVEEN G	✓				
23521118018	RENJITH R S	✓				
23521118019	SIVANANDA M	✓				
23521118020	SIVARENJANA R S	✓				
23521118021	SIYA S NAIR	✓				
23521118022	SOORAJ S S	✓				
23521118023	SRAVYA S. S.			✓		
23521118024	SREELAKSHMI. B . J	✓				
23521118025	SREELAL. L S		✓			
23521118026	ABHILASH J		✓			
23521118027	ABHINAV S		✓			
23521118028	ABIN DAS M B	✓				
23521118029	ADITHYA L.R.	✓				
23521118030	AKHILA B	✓				
23521118031	AMRITHA RANI. P.K	✓				
23521118032	ANANTHAKRISHNAN	✓				
23521118033	ARDRA.G	✓				



23521118034	ASWATHY S NAIR	✓				
23521118035	B S ADIDEV		✓			
23521118036	DEVIKA B V		✓			
23521118037	DEVIPRIYA.R		✓			
23521118038	GOURINANDA K A		✓			
23521118039	KAVYA J		✓			
23521118040	KRISHNENDU S		✓			
23521118041	LEKSHMY P			✓		
23521118042	MEGHA MANOJ R	✓				
23521118043	NANDHANA S R	✓				
23521118044	PRANAV R B	✓				
23521118045	ROHITH S S	✓				
23521118046	SABARINATH S P	✓				
23521118047	SREERAG S	✓				
23521118048	ADHITHYA KRISHNAN A	✓				
23521118049	ANOOP S	✓				
23521118050	ASWATHY KRISHNAN	✓				
23521118051	ATHIRA R S	✓				
23521118052	G A GOPIKRISHNAN		✓			
23521118053	JAGANNATH S		✓			
23521118054	VYSHNAVI V S		✓			
23521118055	GOKUL KUMAR A G		✓			
22021118001	ADWAITH. J.S		✓			
22021118002	AKHIL S S		✓			
22021118003	AKSHAY. A		✓			
22021118004	AMRUTHENDU M	✓				
22021118005	ANASWARA.P	✓				
22021118006	ARATHY R	✓				
22021118007	ARSHA PRASAD N	✓				
22021118008	ASWANI A.S	✓				
22021118009	B AMAL BHASKAR		✓			
22021118010	GOWTHAM SANKAR S	✓				
22021118011	HARIKRISHNAN D	✓				
22021118012	NANDANA MUKUNDAN		✓			
22021118013	NANDU G.P			✓		
22021118014	NEETHU S			✓		
22021118015	NIDHUN S R		✓			
22021118016	RITHIN P			✓		
22021118017	SANUSH .S	✓				

22021118018	SARAN PRASAD V	✓				
22021118019	SREELEKSHMI S S	✓				
22021118020	VAISHNAV. I	✓				
22021118021	VISHNU V. S		✓			
22021118022	ABHIJITH D			✓		
22021118023	ADARSH RAGHAVAN		✓			
22021118024	ADITHYA M R		✓			
22021118025	AFRAN S		✓			
22021118026	AMAL KRISHNA M	✓				
22021118027	AMALA UNNI B S	✓				
22021118028	AMALU AJAY	✓				
22021118029	ANAND SHAJI		✓			
22021118030	ANANTHA KRISHNAN			✓		
22021118031	ANUPAMA R.NAIR			✓		
22021118032	ASWANI A L			✓		
22021118033	DEVI NANDANA .P.S		✓			
22021118034	DHANUSH J		✓			
22021118035	GAYATHRY P V	✓				
22021118036	GOPIKA G	✓				
22021118037	GOURI	✓				
22021118038	HARI MURALI		✓			
22021118039	JOBITHA MOL J J		✓			
22021118040	M S ATHUL		✓			
22021118042	SANGEETH KRISHNA.	✓				
22021118043	SANKAR GANESH	✓				
22021118045	NAVEENA V	✓				

  
 DR. ...  
 M.A.M. ...  
 THIRUVANANTHAPURAM ...  
 ...SICS  
 ...COLLEGE

## Report

This course was conducted for 98 students.

Upon completion of this course, students are able to describe the Big Bang, explain the age and origin of the Solar System and illustrate differences between Earth and other planets in the Solar System, galaxies. Importantly, students gained the scientific basis to summarize conditions necessary for life and to assess scientific evidence for life on other planets. Along with this class, a star watch program was also conducted in the evening. Students will be able to identify bright, naked eye stars and constellations. Students studied about the interrelationships between the Earth, Moon and Sun. Explain Earth's motions in space: rotation and revolution, Acquire knowledge of the Physical universe and its evolution, Define and use fundamental principles and techniques of astronomy and astrophysics, Understand and apply basic physics and computational techniques to solve problems in astrophysics, and interpret the results. Students will be able to examine and critique the expansive and dynamic nature of our Universe, within a historical perspective. Students will be able to explain the evolution of stars as well as of the large scale structure of the Universe. Current understanding and investigation of the basic knowledge about cosmic threats viz., comets, asteroids, meteoroids.

