Physics of the Universe

By

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Lectures

1. Big-Bang & origin of our Universe (1 hr.)
2. Universe Expansion & Hubble's Law (1 hr.)
3. What is Dark Matter? (1 hr.)
4. Dark Matter Types (1 hr.)
5. How have the elements been formed? (1 hr.)
6. The Physics Models of the Universe (1 hr.)

Lecture #1 - Big-Bang & Origin of our Universe

- See video I made for submission in 2019 Science Breakthrough Junior Challenge by Khan Academy
- https://www.youtube.com/watch?v=XPV9H0kVSCQ

Lecture #2: Universe Expansion & Hubble's Law

- See video I made for submission in 2019 Science Breakthrough Junior Challenge by Khan Academy
- https://www.youtube.com/watch?v=XPV9H0kVSCQ

Lecture #3: What is Dark Matter?

- Explain dark matter, dark energy
- Content of dark matter in our universe
- What is it called dark
- Impact of dark matter in our universe

Lecture #4: Dark Matter Types

- Explain Cold Dark Matter & Properties
- Explain Hot Dark Matter & Properties
- Subclasses of Hot Dark Matter
- Subclasses of Cold Dark Matter

Lecture #5: Formation of Elements

- Explain Big-Bang Nucleosynthesis
- Explain Stellar Nucleosynthesis
- See video I made for submission in 2019 Science Breakthrough Junior Challenge by Khan Academy
- https://www.youtube.com/watch?v=XPV9H0kVSCQ

Lecture #6: Physics Models of the Universe

- Explain Standard Model of the Universe
- Explain ƛCDM model of the Universe
- Explain Beyond the Standard Model of the Universe

Teen Workshop Course Proposal Form

Thank you for your interest in partnering with the City of Cupertino's Teen Commission to offer a workshop to the Cupertino community. Please be detailed when lling out this form and feel free to submit any supplemental items (e.g., additional sheets, course material) with your proposal form. Submission of a proposal does not guarantee it will be accepted. The Cupertino Teen Commission will connect with you if your proposal is selected for follow up.

Once you have submitted a form, please email the Teen Commission and Staff Liaison at the following email addresses: danielm@cupertino.org and teencommission@cupertino.org. Google forms does not send us noti cations and we would like an expedited process. Upon reaching out, we will schedule a time with you to come present your workshop proposal at a Teen Commission meeting.

Requirements for minors (under 18 years of age):
* Complete a volunteer application.

Email address *

Full Name *

Address *

What high school do you attend? *

Age *

Note: those over 18 years or older will be required to meet different requirements than those under age. Proof of age will be required if we move forward with your proposal.

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Primary Phone Number *

Please give us the best number to text/call you at.

E-mail *

Please input an email that you check regularly.

What is the name of the workshop you will be conducting? *

Understanding Physics of the Universe

Describe the workshop you will be conducting in detail. Please include who your target audience is and why this will be helpful or what education gaps you are trying to ll. *

It is important to understand the universe we will in. How the universe was formed via the Big-Bang, how old it is, is it expanding, formation of the elements, dark matter, etc.? Without knowing all these things, we do not have a complete understanding of science. Understanding these facts will increase our capacity to understand science better.

Target audience: Middle School and Up

Upload any course materials here (Example: syllabus, powerpoint, Prezi, etc.)

While not required, uploaded course materials will help us come to a quicker decision.

Physics_of_the_Un...

Write a 40-word description of your workshop that the City may use in promotional content. *

The workshops is an introduction to the Physics of the Universe. It will focus on basic facts including the Big-Bang, Universe Expansion, Hubble's Law, Dark Matter, and formation of elements. The students will grasp basic fundamentals of Cosmology and Astrophysics.

What days are you available to conduct your workshop? *

- [ ] Monday
- [ ] Tuesday
- [ ] Wednesday
- [ ] Thursday
- [ ] Friday
- [x] Saturday
- [x] Sunday

What age groups would your workshop be open for? *

- [ ] 6-10
- [x] 10-14
- [x] 14-18
- [ ] Other: _____

How many students are you expecting at your workshop? *

20+

What potential materials would you need to be provided for you to conduct your workshop? *

- [x] Wi-Fi
- [x] Tables & Chairs
- [x] Whiteboard
- [x] Projector
- [ ] TV/DVD player
- [ ] Other: _____

How would you handle a situation in which a student in your workshop was being disruptive and distracting everyone around them? What if they questioned you and the information you were teaching? (max 150 words) *

I will try to handle the situation in a calm manner. I will ask the student if there is something troubling him or if he needs something. If he has a question, I will calmly answer. If the behavior continues, I will tell him that we have a time limit in which the course material needs to be covered and his cooperation will be appreciated else others will also not be able to understand the facts.

If the student questions me, I will answer to the best of my knowledge. I will happily explain all facts. If the student has a valid question which I do not know or understand, I will admit it. I will then tell the student that I will be happy to discuss with him offline. I will also tell the class that I will look up the facts and share the answer via email.

Why do you want to have your own workshop with the city of Cupertino? (max 150 words) *

I love Physics and like to learn more. I put learning over everything else. I have completed college-level courses in Physics and Math from Harvard and Stanford University. I have contributed to the Physics community by publishing one paper in Astrophysics in a Physics journal. A second paper is under peer-review for publication in a major Physics journal. I have also participated in the 2018-2019 Google Science Fair and the 2019 Science Breakthrough Junior Challenge by Khan Academy (see video https://www.youtube.com/watch?v=XPV9H0kVSCQ).

I want to educated the community on Physics. Since I live in Cupertino, I would like to start by educating the teens in our community in Physics. I have also become the Director of Operations of the Physics and Engineering Club at Monta Vista High School during the 2019-2020 school year. Hence, I hope you can appreciate my interest and motivation in this effort.

Please leave any other questions or comments here.