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This is a graded discussion: 10 points possible

Show Due Dates

Z14 Zoom Chat with Scientist/Alumni, 5pm Thr April 28

Erin O'Connor

Apr 23 at 2:19pm

17

DOUBLE Extra credit will be awarded to those who can attend live.

Zoom Chat with Scientist / Alumni, Thr April 28 at 6 pm (DOUBLE Extra Credit if you attend LIVE)

Here is the recording.

https://youtu.be/urKowMxoBOA (https://youtu.be/urKowMxoBOA)

- Rob Geller teaches physics at UCSB, has done research with Black Holes, and is also the author of both a college level physics text and a college level math-based astronomy text. Although he enjoys doing research and working on textbooks, he especially loves to teach and has won several teaching awards at UCSB. In his spare time he rock climbs and we often philosophize about science, teaching, life, family, parallel universes, and how to keep our kids out of trouble!

Each week we will set up a Zoom chat with a scientist working with astronomy, astrophysics, cosmology, or science and engineering, or an alum of SBCC from our astronomy program to see what they are doing now with school, education, or their lives and careers. Some of our former students are doing amazing things. I will be reaching out to contacts I've made over my teaching career so that we can personalize and humanize the material and create more of an "in person" classroom environment.

These Zoom chats are optional. You are not required to attend, but you are certainly invited. These meetings will be at random various times during the week, subject to the availability of our prestigious guests. The meetings are not lectures. I'm more interested in chatting with our guests to have them tell you a bit about their school, work, and interest in astronomy and to give you an opportunity to ask questions and interact with them yourselves.

If you can not attend, that is fine, you will still get full credit by watching the recording and participating in a discussion about the Zoom meeting.

After participating in the Zoom Chat and/or watching a recording of the Zoom Chat, please post your reaction to the meeting. What did you find most interesting about what they are doing or what they had to say? How is it relevant to your life or educational pursuits? What qualities about their approach or perspective to education (or life) do you think has helped them succeed and to

get to a place where a Black Holes Class teacher would want to invite them for a Zoom Meeting with their class (haha).

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Reply

(https:/

Malcolm Tircuit (https://canvas.sbcc.edu/courses/46681/users/427388)

Apr 28, 2022

It was really interesting hearing Rob's reasoning behind why he thinks we are in this universe out of many. It makes me feel even more lucky to exist because of the sheer chances of it. It was also interesting when he talked about how there may actually be a finite amount of universes instead of the "infinity" which is mostly referred to when talking about parallel universes. I also thought it was interesting that when the milky way and Andromeda collide, no stars will hit each other.

Reply

(http

Erin O'Connor (https://canvas.sbcc.edu/courses/46681/users/24247)

Wednesday

Yes, generally people think of the universe as being singular, the only one, or they think of it as being infinite. Rob made a good case and explained why there theoretically might only be a finite number of universes and what I loved hearing was that he built his argument around abstract concepts that we have developed in this class. His argument was that if you had an infinite number of universes, then in some universes the energies of the subatomic particles would be too high and we would get subatomic particles with energy so great, that they would collapse down to become microscopic black holes. We discussed primordial black holes and microscopic black holes in this class and so this in general would be an advanced abstract concept that most people would not relate to. So I thought that was great that he proposed an argument that related to this class, and he didn't have any idea that we had discussed in depth these dame concepts.

Reply

(http

Erin O'Connor (https://canvas.sbcc.edu/courses/46681/users/24247)

Wednesday

That's true that when the Andromeda galaxy and the Milky Way Collide, it is very unlikely that any stars at all would crash into each other. That's because the space between the stars is just so great. A similar analogy can be made with atoms of solid objects here on Earth. If you could turn your electric charge off and walk through a wall, none of the atoms in your body would collide with the atoms in the wall because the atoms are mostly entirely empty space. In fact, if the nucleus were the size of a basketball, the electron would be 20 miles away. So this is a very similar analogy. However, beware, if you turned your electric charge off, all the atoms would fall apart and so it wouldn't be very practical, and I don't recommend giving it a try.

Reply

(https:/

Sarah Savage (https://canvas.sbcc.edu/courses/46681/users/375381)

Apr 29, 2022

Today's guest speaker was fantastic! Professor Geller shared his thoughts on the idea of the multiverse and really got me thinking about how this could work. He said that scientists have attempted to use simulations to re-create our universe and found that many different types of alternate universes have been "born" of these efforts. These universes may have started in a similar way, but the results could be different. For example, if the Big Bang wasn't strong enough or hot enough then the H atoms may not have fused, leaving an inert universe full of H gas. A universe that doesn't achieve a certain level of complexity could never become home to life, much less intelligent life like humans. So we would never know for sure if these existed. There's also the possibility that other universes develop with different laws of physics somehow, making it impossible for us to detect or interact with. I'd love to learn more about these universe simulations and possible alternate laws of physics. As if our own universe weren't mind-boggling enough! This zoom definitely left me brainstorming more questions I'd love to ask.

Reply

(http

Erin O'Connor (https://canvas.sbcc.edu/courses/46681/users/24247)

Wednesday

Yes, Rob is a true thinker and teacher. He loves to explore ideas and share them with others and to discuss and debate. I'm sure you could reach out to him and continue

discussions and debates. Especially if you transfer to UCSB, you can just drop by his office to say "hello".

Reply

Alak Fryt (*He/Him*) (https://canvas.sbcc.edu/courses/46681/users/354278)

Apr 30, 2022

What really caught my attention was when Rob was talking about the mass whale beaching's and the hypotheses that researchers have proposed to explain this phenomenon. I really liked the way that Rob put it, how things so far away such as the solar flares from the sun can have such great effects on the things that happen on Earth despite being so so far away. It's really crazy to think about a random solar flare suddenly disturbing life on Earth, or in this case the magnetic navigation for whales in the ocean.

Reply

Erin O'Connor (https://canvas.sbcc.edu/courses/46681/users/24247)

Wednesday

What a great example. Rob was careful to say that this is not definitively determined, but I think in science it's intriguing to explore possibilities. It is very possible that this is indeed what is happening, that whales are navigating magnetically and that the Earth's magnetic field is disturbed by solar activity from the sun, and thus whales end up getting confused and go the wrong way. Because they travel in pods they can end up beaching themselves by the hundreds. It's a tragic and horrific situation and biologists have struggled to understand this for hundreds of years. Perhaps the solution is indeed astronomical.

Reply

Franco Diaz Campo (https://canvas.sbcc.edu/courses/46681/users/403036)

May 1, 2022

Hi everyone,

It was a good week and a great meeting! Rob Geller is such a nice professor! I would love to take a class with him, I think he is a professor that can teach us too much. I am very glad he teaches ta UCSB, which is one of the greatest universities that are now in the USA. I liked a lot

the research he made about black holes, it is a topic that calls a lot my attention, and when we study it in class, it passionated me a lot. It was a nice conference, the only thing that struggled me a bit, was that we didn't have photos (from what I remember) or something for having idea of what he was exactly talking about. I enjoyed it a lot!

Reply

Erin O'Connor (https://canvas.sbcc.edu/courses/46681/users/24247)

Wednesday

Glad to hear you enjoyed the conversation. If you transfer to UCSB you can take his class and talk with him some more about these things. Be sure to remind him that you heard his talk here in the Zoom Chat for the black holes class.

Reply

Lukas Gott (https://canvas.sbcc.edu/courses/46681/users/417976)

May 1, 2022

I think Professor Geller's topic of how quantum physics and a ever expanding universe had stumped various types of scientists goes under in hand with Hawkins lecture this week. It's combined for a absolutely massive headache but is quite interesting once I thought I got my head around it. I still am slightly confused on how a ever expanding number of universes (complex and simple) leads to our universe being perfect for inhabiting life, but maybe I'll get there one day. While I'm not planning on following a Astronomy degree if I do go to UCSB, it's nice to know of a great teacher as a future reference for classes.

Reply

Erin O'Connor (https://canvas.sbcc.edu/courses/46681/users/24247)

Wednesday

I loved your quote about how Rob's discussion of parallel universes and this week's discussion of Hawking's Grand Unification Theories, combined to give you a massive headache! I think that says it all! Haha!

Reply

Brian Wolden (https://canvas.sbcc.edu/courses/46681/users/274832)

May 1, 2022

It was great to hear Professor Geller talk about so many fascinating topics. I feel like I now have a much better understanding of the multiverse and rationale behind it as well as the distinction between the multiverse and the MWI of quantum mechanics. I had previously assumed that the MWI was a product of the quantum mechanics that allowed for the multiverse but now I have a better understanding of the distinction between the two theories. I also appreciated Professor Geller's interactive teaching style in both asking questions of, and taking questions from, those in attendance. Would love to take one of his classes if I end up at UCSB.

Reply

Erin O'Connor (https://canvas.sbcc.edu/courses/46681/users/24247)

Wednesday

I'm glad you enjoyed Rob's teaching style. He has a friendly and approachable demeanor that encourages and inspires students. Yes, I hope you get to take Rob's classes at UCSB some day.

Reply

Abigail Jacobs (*She/Her*) (https://canvas.sbcc.edu/courses/46681/users/367167)

May 1, 2022

Rob Geller is such an interesting man, his explication of the universe was a little too complex for me but he was explaining everything in a way that was detailed but to the point and it was also visual which for someone like me is very helpful. He seems like an awesome teacher! I did really like the beginning where he explained how whales' paths seem as though they follow magnetic stripes on the ocean floor. When there are solar flares from the sun that hit the earth, it changes the magnetic path that the whales follow and could have something to do with the beaching of the whales. It's a really cool idea and I totally think that this could be true.

Reply

Erin O'Connor (https://canvas.sbcc.edu/courses/46681/users/24247)

Wednesday

Alak made a similar comment about whales. I'll answer with the same ideas here as well. Rob was careful to say that this is not definitively determined, but I think in science it's intriguing to explore possibilities. It is very possible that this is indeed what is happening, that whales are navigating magnetically and that the Earth's magnetic field is disturbed by solar activity from the sun, and thus whales end up getting confused and go the wrong way. Because they travel in pods they can end up beaching themselves by the hundreds. It's a tragic and horrific situation and biologists have struggled to understand this for hundreds of years. Perhaps the solution is indeed astronomical.

Reply

(https:/

Naomi Xu (https://canvas.sbcc.edu/courses/46681/users/27955)

Tuesday

My biggest takeaway from this week's zoom, is the value of office hours. Without it, professor Geller might not even be talking to us about parallel universes or quasars, not to mention it wasn't even for a class that he was in lol.

Reply

(http

Erin O'Connor (https://canvas.sbcc.edu/courses/46681/users/24247)

Wednesday

Haha... yes,... his story of going to his older brother's physics teacher's office hours and how it changed his life! Wonderful! I always tell students, take advantage of office hours!!!

Reply