

Carl Sagan: Great Science Communicator

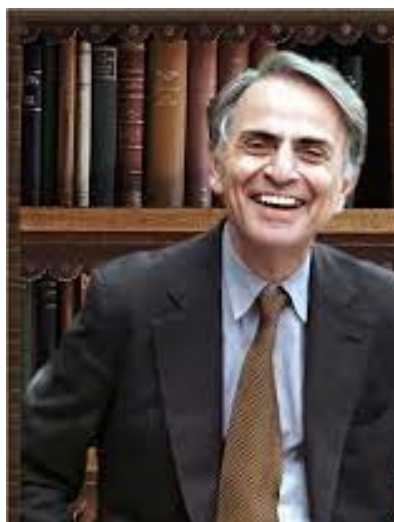
Round#2 – Oral Presentations – Road map.

1. Introduction

Good evening, I am Paulo Santos. I have a degree in IT from Unicarioca University (Rio de Janeiro), and I was third the place in the 2022.1 entrance exam at this course. I've been here at UERJ before, taking courses on computer science, economics, and philosophy, but this current course has been the most interesting one – thanks to you, very interesting people - so I'm happy to be with you tonight. Eventually, you will see articles about physics and artificial intelligence on my website under the nickname Hali Omani - but not today.

Today, I'm here to talk about Carl Sagan – not only his work, but his way of discovering talents – and also to talk about a very specific aspect of his abilities. I intend to show that, by watching his recorded lectures, we will become better speakers.

2. Studies and work of Carl Sagan



This north american from Brooklyn, New York City, named Carl Edward Sagan (1934-1996) was a planetary scientist, astronomer, astrobiologist, extrabiologist, astrophysicist, writer, scientific

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popularizer, environmental activist, anti-nuclear activist, disarmamentist (and was even arrested due to protests in Nevada – by the way, the same misadventure as the famous philosopher Bertrand Russell in the UK). He was a supporter of the "kick weapons out of space" movement. Dr. Sagan has written more than 600 scientific publications and more than twenty popular books (including “Cosmos” and “Dragons of Eden”) and science fiction (including “Contact”, which was turned into a film, starring actress Jodie Foster).



Illustr

ation 1: Jodie Foster as Dr. Eleanor Arroway - "Contact" - 1994.

Sagan was a co-founder of the SETI Institute, the Planetary Society, and the Committee for Skeptical Inquiry. He earned a bachelor's degree in arts and sciences, a master's degree in physics, and a doctorate in astronomy and astrophysics from the University of Chicago. He taught at Harvard until 1968, when he was invited to teach at Cornell University, where he remained until the

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end of his career.

Sagan's list of awards¹:

- Klumpke-Roberts Prize (1974)
- Rittenhouse Medal (1980)
- Oersted Medal (1990)
- NASA Medal for Outstanding Public Service (twice)
- Pulitzer Prize for General Nonfiction (1978)
- Public Welfare Medal (1994)
- Gerard P. Kuiper Award (1998)

3. Young scientific talents

There is a bielo-russian word for “teacher” – the one who teaches: “titchie”. There is another word for the one who teaches by example of life - “navástnik”. Carl Sagan was a “navástnik” for sure.

One of Sagan's most notable characteristics was his encouragement of young scientific talents. This is described by Neil deGrasse Tyson (director of the Hayden Planetarium and the Rose Center for Earth and Space and Research associate in the department of astrophysics at the American Museum of Natural History):

“I was seventeen years old and I applied to a few colleges and one of them was Cornell. Carl Sagan was a professor there. Sagan read my application and wrote me a letter in his own handwriting ! He said: Neil, I see that you are very interested in the universe – só do I ! Why don't you come to the campus? I'll show you everything and help you decide. I got on a bus in New York City in December and went to Ithaca, NY. Sagan met me in front of his building. It was Saturday. He showed me everything in person as all the support staff were off duty. Sagan took out a book of his, which he had signed for me. The dedication read: To Neil, future astronomer. Then he drove me to the bus stop. I don't know if

¹ Slide for reading only.

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*the bus will make it through," he said. Here's my card with home phone number. If the bus gets stuck, call me; you will be able to spend the night with my family. And I thought: who am I for him to treat me this way? If I'm ever remotely as famous as Carl Sagan, I'll treat the next generation of students like he treated me."*²

Tyson was just one case. Names such as Steve Squyres (planetary scientist who stood out as principal investigator for NASA's Mars Rover mission), David Grinspoon (astrobiologist and writer) and William J. Borucki (astrophysicist who led NASA's Kepler mission), just to name a few, swell the list.

2 Adaptado de STARTALK, 2022.

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Neil deGrasse Tyson (c)

<https://images.app.goo.gl/cNqqaaaLztUzVRVZA>



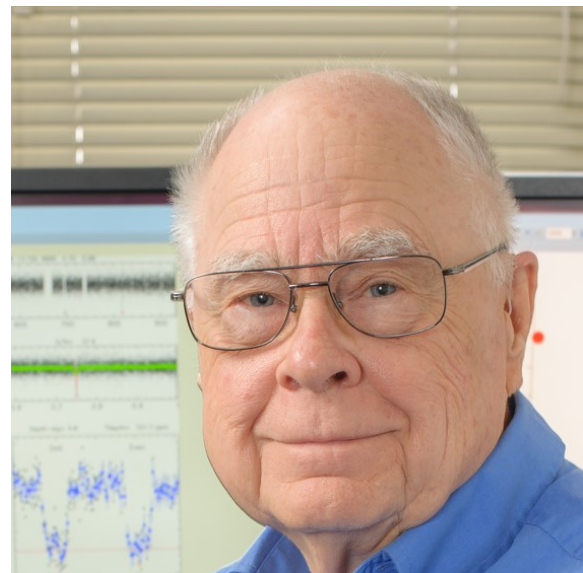
Steve Squyres (c)

<https://images.app.goo.gl/EtevHBqcCzdUT2Wh8>



David Grinspoon (c)

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William J. Borucki (c)

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4. Excellence in spoken presentations

As I said, Dr. Sagan does not appear here strictly as a scientist. It was his excellent skills as a presenter, interviewee and speaker that made me turn my eyes to his production. When I started watching his lectures on YouTube and other sources, it became clear that here was a master in the art of presentation. Although their content was always wonderful, the beautiful way in which he expressed his ideas deserved special attention. I hope to share with you some of the techniques observed in Sagan, which will certainly be useful to us.

5. Oral presentation rubrics

Allow me, for a moment, to recall the “Oral Presentation Rubrics” that we studied in this course:

- A) CONTENT
- B) ORGANIZATION/CLARITY
- C) COMPLETENESS
- D) GRAMMAR/SIGNPOSTING/MECHANICS
- E) PRONUNCIATION
- F) DOCUMENTATION
- G) DELIVERY
- H) EYE CONTACT**
- I) VISUAL AIDS (AND WHY NOT AUDIO ?)**
- J) INTERACTIONS**

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I chose a presentation by Dr. Sagan, which could serve as an example of good practice (more details in the references)³:

- (CARL SAGAN INSTITUTE, 1994) – A 39-minute presentation. Sagan answered the most varied questions. What stands out most is his empathy with the audience. The jokes are well chosen and he controls the show.

³ Previously, there were two lectures at all (this one and ROYAL INSTITUTION, 1977), but the time available today would not be enough.

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Here I will describe a few but notable aspects of the presentation that fit into the “Oral Presentation Rubrics”. There are more examples, if you can watch the full video.

VISUAL AIDS (AND WHY NOT AUDIO ?)

Sagan showed a photo of our planet, taken from a camera on the Voyager 1 spacecraft, then at the edge of the solar system – the heliopause:



Illustration 2: <https://lowell.edu/astroalert-nasa-remasters-the-pale-blue-dot-photo-of-earth/>

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The photo itself didn't say much to the lay public, but its value was precisely this. Notice how Sagan accompanied this photo with a text that conveyed its due value:

"..that's home, that's where we are ... on it

Everybody you love, everybody you know, everybody you ever heard of, lived out their days there.

The aggregate of all our joy and suffering, thousand of confidants, ideologies, religions, economic doctrines, every hunter and forager⁴, every hero and coward, every creator and destroyer of civilizations, every king and peasant⁵, every young couple in love, every hopeful child, every mother and father, every inventor and explorer, every revered teacher of morals, every corrupt politician, every uncorrupt politician too, every superstar, every supreme leader, every saint and sinner in the history of our species ... lived there."

Transcript of [https://youtu.be/6_-jtyhAVTc?t=3744]

Now that you see this photo and associate it with this text, it is clear that our history is made on this insignificant pebble in the sky. The validity of space exploration is often discussed. I believe that just this photo and this text would be a good answer.

INTERACTIONS

There is a moment in the Q&A where a young woman - with a not very powerful voice - asks a question. Sagan repeats the question to the audience, but justifying this repetition:

"That's an important question. I'll repeat it, because your voice while lovely is very soft..."

Transcript of [https://youtu.be/6_-jtyhAVTc?t=4184]

These are words chosen with great care and with skill. The examples could go on for more than an

4 Plantador

5 Camponês

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hour but our time is limited.

6. Resumo

In this lecture,

- We knew a little about the life and work of Carl Sagan.
- We discovered how he worked in the search for young scientific talents.
- We explained how Sagan's lectures can be a valuable source of oral presentation techniques.
- We gathered references in one place for later consultation.

I invite everyone to visit the references on the website: [<http://treinamentolivre.com/sagan>] where you can see this presentation and the road map.

I am available for questions.

Thank you very much !

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7. References

- CARL SAGAN INSTITUTE: Carl Sagan's 1994 "Lost" Lecture: The Age of Exploration. 1994. <Available in https://youtu.be/6_-jtyhAVTc?si=-XlX7fgiibEmincq>.
- DRUYAN, Ann: Carl Sagan: A Life. 1999.
- ROYAL INSTITUTION: Carl Sagan: Christmas Lectures 1 - The Earth as a Planet. 1977. Available in < <https://youtu.be/BdXtjNSDi4s?si=3t53h0697acKtm5d> >.
- STARTALK: Neil's College Application Letter: Carl Sagan's Letter to Neil deGrasse Tyson. 2022. Available in < <https://www.youtube.com/watch?v=pCbsCDnz2Vo> >.
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