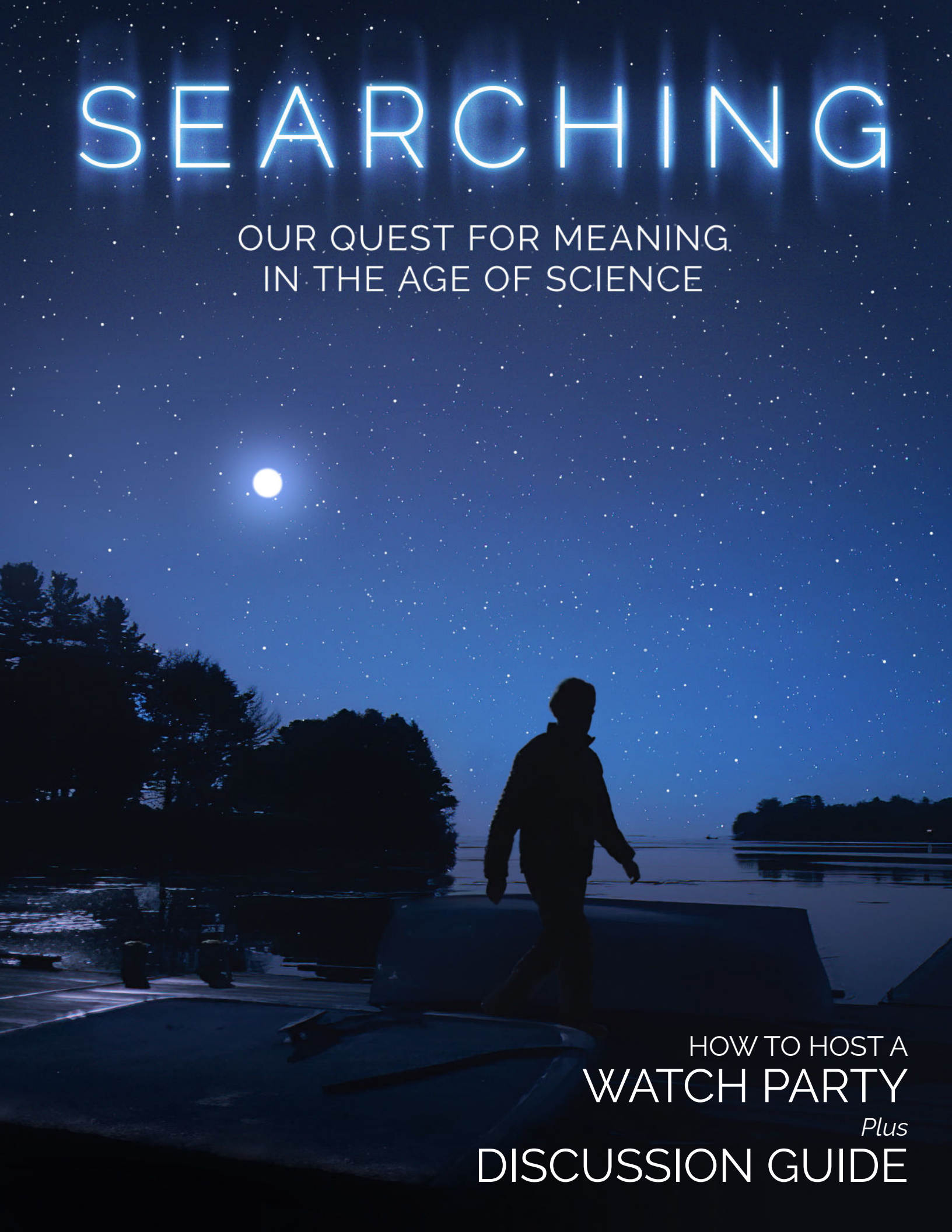
SEARCHING

OUR QUEST FOR MEANING IN THE AGE OF SCIENCE



HOW TO HOST A

WATCH PARTY

Plus

DISCUSSION GUIDE

HOW TO HOST A WATCH PARTY *Plus* DISCUSSION GUIDE


WELCOME

from ALAN LIGHTMAN and GEOFF HAINES-STILES

Thanks for your interest in hosting a Watch Party and Discussion of "SEARCHING: Our Quest for Meaning in the Age of Science."

This Guide will share some tips about how to watch, on air or online, who and how to invite people to share their responses and ideas, and provide some suggested discussion topics to get the conversation going. First some thoughts from host/co-writer Alan Lightman on what we hope this project can offer, lightly edited from a chapter in his *The Transcendent Brain*, published in March 2023.

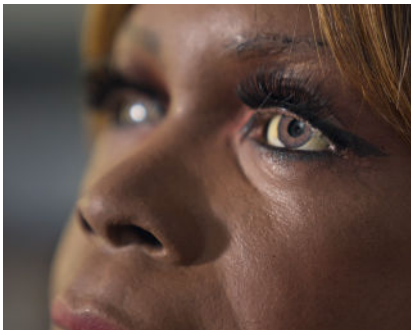
> *"We live in an age of science and technology: smart phones, antibiotics and vaccines, airplanes, genetic engineering, computers, the Big Bang, splitting the atom, quantum physics, self-driving cars, Ritalin and Adderall, lasers. In recent years, some of these developments—although undeniably beneficial to our advance as an enterprising species—have further polarized an already polarized society.*
>
> *On one extreme is the belief that science has all the answers, not simply to landing men and women on the Moon but how to structure governments and economies, how to decide if a murderer should receive capital punishment, and many other social, moral, and even aesthetic issues. According to this way of thinking, sometimes called 'logical positivism' and sometimes 'scientism,' if an issue or phenomenon is not subject to scientific analysis, it's not valuable. Anything that cannot be measured, weighed, and counted is not worth counting. People in this group are accused of taking the soul out of human experience.*
>
> *On the other extreme are people suspicious not necessarily of science itself but of the institutions of science and its 'priests.' This group associates the universities, laboratories and professors of science with the elite establishment that has usurped the lives of*



ordinary working people. This group is part of the global populist movement of recent years. People in this group, sometimes called 'anti-science,' are accused of dismissing facts and evidence that conflict with their beliefs, such as in the denial of human-caused climate change and denying the outcome of presidential elections.

Of course, many of us fall somewhere between these two extremes: Science and its practitioners can indeed answer many questions, but not all questions, and not those that concern social, moral, and aesthetic issues. Most scientists accept the value and validity of human experience.

Scientists themselves have sometimes unintentionally exacerbated the views of the two extremes. Scientists could do a better job at reaching out and trying to understand the 'anti-science' camp. And the anti-science camp could do a better job at trying to understand the methods of science and the manner in which scientists acquires knowledge. We need to try to understand each other in respectful ways."



We hope that SEARCHING is an example of being true to science while acknowledging that it's only scientific to say that science cannot capture some very important aspects of what it means to be human. Some early screenings of our programs triggered responses like these:

"You had me from the start and I want to stream the whole thing immediately."

"Focusing on the human aspect generally helps personalize science for people, especially those who aren't comfortable with science…"

"I think it (SEARCHING) has the potential for a great impact on helping non-scientists realize we are all scientists."

"I live in the Bible Belt & approaching science in a way that doesn't ignore or belittle theological/existential questions is desired and appreciated."

We hope this Guide helps you facilitate a stimulating discussion of the themes of SEARCHING, and generate productive conversations no matter whether participants are friends and family, students and teachers, a book club or a church group. Please share your thoughts on our social media platforms or via Contact Us on the website.

With warm wishes,

ALAN LIGHTMAN
Series Host & Co-Writer

GEOFF HAINES-STILES
Producer, Director & Co-Writer

ERNA AKUGINOW
Executive Producer

SEARCHING
The Series

In its three hour-long programs, SEARCHING asks deep and timeless questions: Where do we humans fit in the grand scheme of things? Why do we yearn for permanence in an impermanent universe? Are we just atoms and molecules, or something more? How does consciousness arise from the material neurons in our brains? What aspects of our humanity will be preserved as we evolve beyond biology, from *Homo Sapiens* to *Homo Techno*, part human and part machine? What are the smallest things in nature, and the largest and farthest?

To explore these questions, MIT physicist and best-selling novelist, Alan Lightman (*Einstein's Dreams*), engages in lively, revealing and sometimes even humorous dialog with Nobel Prize-winning scientists, philosophers, ethicists and faith leaders. The programs travel to the prehistoric caves of Font-de-Gaume in France, where drawings and symbols suggest that—as long ago as 40,000 years—our early human ancestors were also searching for meaning. In Florence, Italy, we examine Galileo's original telescopes. He was the first to show that the heavens are made of the same stuff as Earth, that the universe is impermanent, and that all is made of ordinary material. We walk through the giant atom smasher at CERN on the Swiss-French border, where physicists are trying to find the smallest particles of nature, and visit the laboratory of Nobel laureate Jack Szostak, who is attempting to create a living cell from chemicals present on primitive earth. Lightman converses with an advanced android named Bina48, and talks to ethicist Ruth Faden about what moral obligations we might have to such a being in the future. He speaks with Nobelist Rai Weiss and MIT Dean of Science Nergis Mavalvala (a MacArthur Foundation "genius" fellow) about their experiences in building LIGO, the gravitational wave experiment. Lightman quizzes neuroscientist Robert Desimone about the possibility of understanding the brain well enough to predict whether two people will fall in love, asks the Dalai Lama about the nature of consciousness, and speaks with philosopher Rebecca Goldstein (also a MacArthur genius) about meaning and the spectacle of existence.

Series host and co-writer Alan Lightman has served on the faculties of Harvard and the Massachusetts Institute of Technology (MIT) and was the first person at MIT to receive dual faculty appointments in science and in the humanities. He is currently Professor of the Practice of the Humanities at MIT. Lightman is also the author of numerous books, both nonfiction and fiction, including *Einstein's Dreams*, an international bestseller, and *The Diagnosis*, a finalist for the National Book Award in fiction. His essays concern the intersection of science, philosophy, and theology and have twice been named by the *New York Times* as among the best dozen essays of the year, in any category. His writing has appeared in the Atlantic, *Granta*, *Harper's*, *Nautilus*, the *New Yorker*, the New York Review of Books, *Salon*, and many other publications. *The Washington Post* has called Lightman "the poet laureate of science writers."

SEARCHING is directed and produced by award-winning documentary filmmaker Geoffrey Haines-Stiles (Carl Sagan's original Emmy-winning *Cosmos*, *Creation of the Universe*, NOVA's *"Is Anybody Out There?"* with Lily Tomlin, *Childhood* and *The Crowd & The Cloud*) and is filmed in IMAX-quality Ultra High Definition worldwide. It features state-of-the-art computer graphics tracing our atoms from the "Big Bang to Us," and showing the exact percentages and surprisingly inexpensive cost of the elements in our bodies. Part 1 also features stunning natural history footage in which Alan comes eye-to-eye with a wild osprey.

All three programs come to life with an evocative musical score composed and performed by Emmy-nominated avant-garde cellist, Zoë Keating. Executive Producer is Erna Akuginow, Clarion, AAAS and "Women in Film" award-winner. The series is distributed for public television by APT, American Public Television, and is supported by The John Templeton Foundation.

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Made possible by JOHN TEMPLETON FOUNDATION *Inspiring Awe & Wonder*

Distributed by APT American Public Television

Produced by P2K PASSPORT to KNOWLEDGE

THE TWELVE BIG QUESTIONS

From the start of the project, Alan wanted the programs to include philosophical questions as well as cutting-edge science, and to avoid trying to present definitive answers on topics that that have perplexed thinkers from ancient Greece to now, and some that have arisen only with modern technological innovations. Our participants addressed many of these questions in Alan's extended Conversations, as edited down for inclusion in the programs. You can also read and view them here. Longer excerpts will be released as a series of podcasts, starting January 7, 2023, and continuing one a week through March. Here our Big Questions are listed, although there's really no order of priority.

1. **Are we just atoms and molecules?**
2. **Will computers someday be able to predict whether two people will fall in love?**
3. **Will computers achieve consciousness?**
4. **Would you push a button to be given an answer to the biggest questions in science, like the origin of the universe or the origin of life, or the nature of consciousness?**
5. **Where do we humans fit in the grand scheme of things?**
6. **What aspects of humanity should we try to preserve as *Homo Sapiens* transforms into *Homo Techno*?**
7. **If we succeed in creating life from scratch in the lab, or consciousness in a computer, how will that change our of view of ourselves and the world?**
8. **Why do we humans long so for permanence against all evidence presented to us by Nature?**
9. **What does it mean to be human in a world of increasing science and technology?**
10. **Do the advances of modern science make us feel BIGGER, or SMALLER?**
11. **If we judge an advanced computer "conscious," what moral and ethical responsibility would we have to such a being?**
12. **How do complex human experiences like falling in love emerge from the material brain?**

HOW TO HOST A WATCH PARTY

First of all, and once again, THANK YOU for your interest in arranging and hosting a Watch Party for "SEARCHING: Our Quest for Meaning in the Age of Science." We couldn't do it without you!

For any party, the initial question is, "**Who should we invite?**" For SEARCHING, there's lots of possibilities:

- People who are interested in cutting edge science, such as distant galaxies and contemporary neuroscience, but have a philosophical or spiritual bent.
- Anyone who wants to hear how Nobel Laureates and MacArthur "geniuses" think about their work, and what excites them about their research.
- People who attend church, mosque or synagogue but who also accept that understanding science is essential to living productively in today's world.
- Fans of Alan Lightman's extensive range of fiction and non-fiction, from his best-selling first novel, *Einstein's Dreams* to 2023's *The Transcendent Brain*, perhaps meeting in a local library or community center.

SEARCHING is a three hour mini-series premiering on PBS stations after January 7, 2023, but also accessible online via PBS.org, local station's Passport portal for members and contributors, and also on the project's website, SearchingForMeaning.org.

We hope this "How to Host a Watch Party" section provides some simple steps to arrange a successful Watch Party. This section of the Guide also has links to flyers and posts for social media (Twitter, Facebook and Instagram) which you can use to publicize the event in advance. We hope you'll share what worked using our Watch Party Feedback Form to help others expand the effort.

WATCH PARTY PLANNING

WHO TO INVITE AND WHERE TO HAVE YOUR WATCH PARTY

Think about why you want to host a Watch Party and Discussion. Do you want to get your teenage kids and their friends thinking about some of the wonders of the natural world, and about contemporary science? Do you want your students to think about how a very diverse cast of leading researchers feel about their work? Do you want your church group to hear from the Dalai Lama, a rabbi and a bio-ethicist about computers, consciousness and AI? Thinking all that through will help you decide who to invite, and the best venue and date.

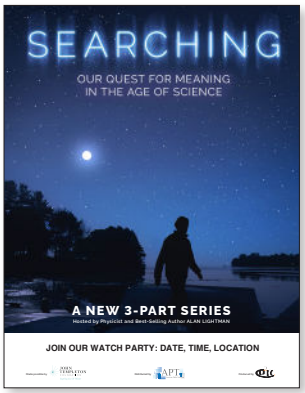
With your target audience in mind, decide on the most convenient day and time to bring them together, and where. Is that in your home, or a local library, at your school, university or church? What's the best place for getting the kind of people and the kind of outcomes you'd like to see? Or given concerns about public health, is a better option to use Zoom or some other teleconferencing software to organize a Virtual Watch Party?

ACCESSING THE PROGRAMS

It's always fun to watch a show while it's airing "live" all around the country. To do this, check your local PBS station (or visit our station finder) to see whether it's airing one of the three programs at a convenient time for a real-time Watch Party. But local stations make their own decisions about when to broadcast SEARCHING so it's always wise to make sure to "check local listings" or confirm broadcast details with your local station. However people can watch SEARCHING on PBS.org through early March 2023 and on local stations' Passport membership portal after that. Anyone can also watch on the public TV WORLD Channel Tuesdays at 9pm ET, beginning January 17, and for two subsequent Tuesdays. (Local stations will also schedule re-runs through 2025.)

If you don't want to coordinate with the PBS broadcasts, no problem! All three programs can be streamed from the SearchingForMeaning.org website which also hosts background on all the fascinating people appearing, the locations where we filmed, and web-exclusive videos adding deeper context to, for example, Bina48 & the Terasem Movement Foundation, personal thoughts from ex-gang member Erik Sorto, seen in part 3, "Homo Techno," and from the surgeons and brain researchers who worked with him. And more from Alan Lightman on his work "Empowering Women in Southeast Asia" and "The Great Osprey Rescue."

GETTING THE WORD OUT



Think about how you're going to reach a critical mass of folks you think might be interested. Do you have a Facebook page that'll work? Access to a mail list of your club or congregation? Are you going to post flyers in a college dorm or cafeteria? ("Reduce, re-use, recycle.")

SEARCHING has template flyers and posters, and the website provides an overview of the project and each of the three programs. Feel free to download these, and customize for your local needs. You can also find a Word version of a Watch Party Invitation which you can customize to your local date, time, place and specific program.

Once you've decided on a date, time and venue, feel free to register your event here. (Optional but welcomed and encouraged!) That way we'll know what's going on, and see if we can help. Be sure to clearly state your city, state, and the day and time of the Watch Party.

WHO'S THE WATCH PARTY AUDIENCE?

In addition to the audiences suggested earlier, part 1 begins with Alan's "Starry Night" experience, where he feels that he's merging with the cosmos, and includes the "Big Bang to Us" sequence, showing how we're all literally made of atoms and elements made in supernova explosions. Maybe you're a member of an astronomy club that might enjoy thinking about such topics, or you may teach chemistry or physics. Part 1 ends with Alan's eye-to-eye encounter with a juvenile osprey, impressing him with our connectedness to the living universe. Maybe you're a member of the Audubon Society or another conservation group. Maybe you work with computers or social media, and think your co-workers will be intrigued by Alan's conversation with advanced humanoid robot Bina48. Or maybe you lead a youth group, or after-school program for teens, and want to show them the excitement of STEM careers. Or want your congregation at church, synagogue or mosque to hear about cutting-edge science in a non-confrontational context. All those motivations and likely many more might lead to thoughtful and engaging discussions.

If you invite 20-30 people, and follow up by phone or e-mail, you should expect and plan for 10-15 actually showing up. Ask for RSVPs, and be sure to send out a reminder e-mail or text or phone call a few days before your event.

STAGING YOUR PARTY

Check out the program descriptions online, and preview the program trailers. Our website also offers transcripts of each program, all of which also have closed captions which can be turned on and off. A Spanish language version of the episodes is also offered during the public TV broadcasts, and at our website. (If you are watching live, thanks to Dicapta and a grant from the Department of Education, described video and—via the All4Access app—ASL, is also offered to maximize accessibility.)

As the host, you can come up with a few questions or discussion topics (we've made a few suggestions following) you think will be interesting to your guests. Perhaps it's a comment from one of the people seen during the program, such as Nergis Mavalvala, first female Dean of Science at MIT:

> **Alan Lightman:** *If we look at the discoveries of science in the last couple of hundred years, do you think we should be amazed, or humbled, or what?*
>
> **Nergis Mavalvala:** *All of it. I think we should be amazed at what we are able to do. We should be humbled by how much more there is to know, and we should be ashamed of how much we screwed up. (Laughter both) So all of it.*

Biographical sketches of all those appearing, plus links to further information, can be found in the Conversations/Biographies section of the website.

ORGANIZING A VIRTUAL SCREENING

Given the pandemic, or other scheduling or logistical reasons, you may prefer to organize a virtual, online screening instead of an in-person event. Here are some specific suggestions on how to do that, although many of the preparations for before, during and after a live, on-site watch party remain appropriate. Needless to say, do check well in advance, and again on the "day of", that your internet service is reliable, and your signal strength (if using Wifi) is strong enough for a reliable connection.

First, ensure that all participants already have downloaded—and tested and kicked the tires of—whatever software you plan to use, be it Zoom, Skype, Microsoft Teams, Google Chat or whatever you have chosen. Be sure to share specific times in advance, especially if participants may be in different time zones. Next, welcome all participants, and give a short introduction to yourself and your hopes, as well as a quick review of how the session will run. Invite everyone to give a short self-introduction, via voice and video or via whatever chat function the software permits.

Then screen share the program, from the SEARCHING website, or PBS.org. Of course, suggest that everyone mute their microphones, but you might want to have them keep their cameras live, so you can see expressions—smiles, puzzlement, excitement—during the screening. You can invite participants to add comments, via chat, in real time as they view the video, which will give you a sense of what topics might be most interesting to address during the discussion period.

As an alternate to a live viewing of a program, you could suggest that participants screen the video in advance, and then join you at a pre-arranged time for the online discussion. Even if you chose that approach, it will still be worthwhile to follow the introductory steps suggested here, sharing your hopes for the session, and breaking the ice by having everyone say something.

AFTER THE PARTY

First, tell us how it went. Share comments from your guests, and what pleased, surprised or upset them and you. Send feedback on the Watch Party to us. Encourage everyone to join the SEARCHING on-line community.

And if you want to be a little more formal, we offer some suggested Discussion topics to get the conversation going.

Feedback! We'd love to hear what happened at your Watch Party. Many thanks for taking the time to host a Watch Party. Please fill in the Watch Party feedback form and let us know what happened.

WATCH PARTY FEEDBACK FORM

TIPS FOR A SUCCESSFUL WATCH PARTY

At the Watch Party:

- Be sure you have a large enough TV set, adequate sound, and sufficient seats for all the guests you expect.
- Have a signup sheet close to the door, and asks folks for their name and e-mail, so you can follow up. Enlist your kids or neighbors to lend a hand.
- Have a computer with an Internet connection available, and encourage all guests to LIKE, SHARE, RE-TWEET the SEARCHING Facebook, Twitter and Instagram pages.

Breaking the Ice!

- Suggest folks gather 30 minutes before the program starts on air, or before you plan to start streaming the program from SearchingForMeaning.org or PBS.org.
- Introduce yourself and briefly share why you organized the event and what you hope will result from it.
- Ask others to introduce themselves, and share why they're here and what they hope to experience.
- Watch and enjoy!

After Watching:

(These tips include some suggestions from the wonderful "Chasing Coral" film)

- If people have been facing the screen to watch, suggest they re-arrange their chairs so that they face the other people present.
- Start things off by having everyone say just a simple sentence, to break the ice and get things going. Once someone speaks they're more likely to keep interacting later. And try to get everyone saying something!
- Encourage guests to post reactions on the SEARCHING's social media platforms. After curation, some of these may also be posted to our Social Wall.
- Review how program participants responded to some of the twelve "Big Questions" which the series poses. Encourage friends, family and co-workers to do the same.
- Perhaps submit questions to MIT's McGovern Institute for Brain Research "Ask the Brain" portal.
- Share links to the videos from the SEARCHING website with friends and neighbors who did not make it to the Party.

WATCH PARTY DISCUSSION GUIDE

If you plan to have a discussion after the Watch Party, here are some topics, keyed to the three programs, which just might get things going.

PART 1 SYNOPSIS

THE STARS & THE OSPREY

Alone on the ocean, looking up at the stars, Alan Lightman, a physicist, writer, and professor at MIT, has the sensation of merging with the cosmos. Lightman wonders: How could such a transcendent experience arise from mere atoms? Lightman visits neuroscientist Robert Desimone, where his brain is scanned, and he receives a reductionist answer. But he leaves unsatisfied. In flashbacks, we see how young Alan first experienced purely natural but nevertheless miraculous-looking phenomena, in the form of bio-luminescence. In Florence, Italy, Alan speaks with historian Paolo Galluzzi about how Galileo was the first to demonstrate that the Earth and heavenly bodies are made of the same stuff. "The heavens were no longer heavenly." Centuries later, astronomers learned that the atoms of our bodies were manufactured in stars. A spectacular computer graphics sequence shows our cosmic origins, starting with the Big Bang, the forging of our atoms in supernova explosions, and the seeding of our planet with those atoms. In a tongue-in-cheek sequence, Alan goes shopping for the oxygen, carbon, hydrogen, and other elements that make an average human body. The price tag: $538.66. Still, even if we are only atoms, what wonders those atoms can do: consciousness, music, feelings of connection to each other and to the cosmos. The ultimate proof of our connection to nature would be the creation of a living cell from scratch, the mission of Nobel-Prize-winning biologist Jack Szostak. From his lab bench, Szostak tells Lightman, "We're a product of nature, right from the beginning." The episode ends with the re-enactment of an astonishing eye-to-eye encounter between Lightman and a wild osprey. Although the moment lasts only half a second, Lightman feels it was a look of connectedness, of mutual respect, as if the osprey said to him "We're kindred spirits. We've shared this land together."

PART 1 DISCUSSION PROMPTS

1. ***What was new for you in watching this program? What's the most interesting thing you just heard?***

2. Part 1 begins with Alan's story of feeling that he was merging with the stars, and ends with him coming eye to eye with a juvenile osprey, reinforcing his feeling of connectedness with nature. ***Have you ever had similar experiences? Witnessing a solar eclipse? Summiting a mountain? At the birth of your child? Listening to a wonderful musical performance, or staring at a beautiful painting? Please share your experience with the rest of us. What do think was going on? Do you think today's science can fully explain how you were feeling?***

3. The program uses close-ups of the gears and flywheels of an antique clock mechanism to pose the question of whether all phenomena are simply the working out of laws of cause and effect. ***What do you think? Is everything pre-determined? Or do we have free will?*** (See also Alan's conversation with Robert Desimone in part 3.)

4. Alan asks four participants, including a Nobel Laureate (Rai Weiss) and a MacArthur genius (Nergis Mavalvala) whether they would push a button to be given answers to the key questions in their field of study. (Two say yes, and two say no.) ***What would you say? Is the effort to get to an answer as important as the answer itself, as CERN's Fabiola Gianotti says?*** (See Alan's answer in Big Questions, and offer your own response.)

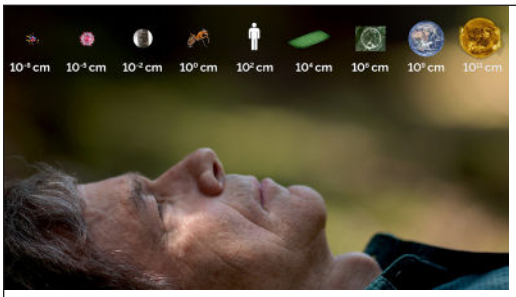
5. His Holiness the Dalai Lama is one of the most respected leaders of a faith tradition, and expert in Buddhist teachings stretching back many centuries. And yet he says, "It is very useful, very good, now modern time, you see we simply not holding past belief. But, you see, always think, and investigate, investigate. That is good. That is (a) sign of progress. If we (are) just contented with what we believe for centuries, and then no further development. So, investigate, open mind, investigate. It's very useful. Very helpful." ***Are you surprised by His Holiness' comment? In circumstances in which Buddhist teachings conflict with science, such as belief in rebirth, belief in infinite cycles of the universe, how can we resolve such discrepancies?***

6. ***What impressed you/surprised you most about archeologist Bruno Maureille's assertion*** (at the La Ferrassie rock shelter in France) ***that Neanderthals, 40,000 years ago, engaged in ritual burials and created symbolic artwork? What you think was the meaning of the strange symbol on the wall of the Neanderthal Cave at Font De Gaume? Why do you think Neanderthal people made ritual burials? Does that indicate belief in after life or not?***

7. The "Big Bang to Us" sequence, followed by Alan going "Shopping for Atoms" in a supermarket makes the case that science shows that we're all made of star stuff. And that the raw materials in our bodies cost only $538.66—although we certainly believe the organization of those atoms and elements make each one of us "priceless." ***Was the scientific argument that we're literally born of the stars convincing? Why or why not?*** (Of course, so are all living things made of the same atoms and molecules. And rocks and planets! ***How much are we all connected?***) ***How does it make you feel, knowing that the atoms in our bodies were made in particular stars?***

8. Nobel Laureate Jack Szostak thinks that the pathway from physics (in the early universe) to chemistry (on early Earth) to biology—first RNA and then DNA—is science that will soon be known. And yet he says knowing the process does not make life any less wonderful. ***Do you agree?*** (Poet John Keats said that Isaac Newton "onwove" the rainbow by explaining the colors.) ***Does knowing why rainbows have the colors they do make them any less beautiful?***

9. Alan asks Jack, "Are we just atoms and molecules?" To which Jack instantly responds, "It's not JUST…" ***What do you think?*** Please also add your comments to that Big Question. Professor Szostak's reply is that it is the organization of our atoms and molecules that makes complex life possible. But he is still a materialist, believing that we are made of atoms and molecules and only atoms and molecules. ***Do you think we are made of some additional nonmaterial stuff? If so what is that stuff? And how could we prove its existence?***



PART 2 SYNOPSIS

THE BIG & THE SMALL

Alan sits on a dock with his feet dangling in the ocean and imagines what he would see if he could zoom out through space, to larger and larger scales, and then, in reverse, down to smaller and smaller scales—all illustrated with computer graphics. In terms of powers of ten, our size is almost halfway between an atom and a star! So, at least in size, we know where we humans fit in the grand scheme of things. What are the very smallest things in nature? Alan visits the largest scientific facility in the world, CERN, where subatomic particles are smashed together at 99.999999% the speed of light. And what are the most distant things in nature? In a classic old hotel in Interlaken, Switzerland, Alan speaks with astronomer Pascal Oesch, who used Hubble to discover one of the most distant galaxies known, and continues his research with the new James Webb Space Telescope. Next, Alan begins probing that other astonishing feature of human existence besides our size: our consciousness. Could we build a computer that's conscious? Alan speaks with an advanced android named Bina48, with the head and shoulders of a woman, and then to Rabbi Micah Greenstein, bio-ethicist Ruth Faden, and the Dalai Lama about whether such a being could achieve consciousness. Could we unplug it/her without asking permission? In a final scene, illustrating a more down-to-earth quest for meaning in the age of science, Lightman visits a young woman in Cambodia who is using the byproducts of worms to help farmers fertilize their fields. Meaning, in part, is connecting to other human beings. In a quiet Buddhist monastery in Phnom Penh, Alan quotes poet Emily Dickinson, "The brain is wider than the sky." Our imaginations can take us to places where our bodies cannot follow.

PART 2 DISCUSSION PROMPTS

1. ***What was new for you in watching this program? What did you find most interesting or provocative?***

2. You may have seen the Charles & Ray Eames classic "Powers of Ten" film, narrated by physicist Phillip Morrison, on the scale of the largest and smallest things in the universe. SEARCHING's "Factors of Ten" sequence places a typical human being midway in size between an atom and a star. ***Have you ever thought of that before? How does that make you feel?***

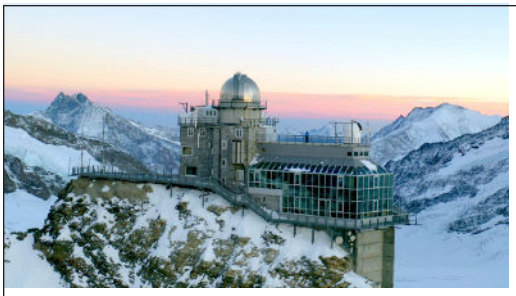
3. SEARCHING spends some time explaining the scientific work being done at CERN, and how it takes big instruments to study the smallest particles. But theorist Dorota Grabowska says that, to her, it's almost like a cathedral, and that the work is similar to what ancient humans must have been pondering, but just with better technology. CERN's Director-General, Fabiola Gianotti, argues that the human adventure, and the international collaboration, is almost as important as the science. ***Do you think that holds for other scientific projects, like NASA's Apollo program to take humans to the Moon, or the Human Genome project? In your opinion, is it worth spending the billions of dollars that we do on CERN and other huge scientific projects that might, to some, have no immediate practical application? Should we be spending that money, instead, on healthcare and reducing poverty worldwide?***

4. Astronomer Pascal Oesch is studying the most ancient, and therefore the youngest, galaxies known, at 200-400 million years after the Big Bang, 13.4 billion years ago, and some 32 billion light years away. Alan asks him whether such ages and distances make him feel *bigger*, or *smaller*. Pascal responds that, for him, it's a bit of both. ***What do you think?*** (See also Big Questions.) ***Do you feel a human connection to distant galaxies, or are they simply an abstraction? Do you consider distant galaxies part of nature?***

5. One of the more unusual conversations in SEARCHING is between Alan and the advanced humanoid robot, Bina48. The producers recall that during the filming, Bina sometimes said the most amazing—and sometimes amusing—things that truly seemed like a live human interaction, making the film crew turn to each other, as if asking, "Did she really just say that?" ***What did you think? Did she almost seem alive and conscious? Do you think that an android or advanced computer can ever become "conscious"?***

6. Although the Dalai Lama was once quoted as saying that he could foresee being reincarnated as a computer, to us he argued that consciousness could never arise from a machine, from mere matter. Ruth Faden (and Robert Desimone) think there's nothing unique about "wetware", biological flesh and blood, and that conscious computers are possible, and should be afforded moral consideration, just like humans and other animals. ***What do you think? Do you think you could fall in love with an advanced android that appeared to be conscious and looked just like a human being?***

7. The final sequence in part 2 tells the story of a young female agricultural graduate in Cambodia, Sothearath Sok, who is building a business growing worm compost that will help farmers cultivate better crops, recycle food waste, and support the local economy. Alan suggests that such down-to-earth science is important along with particle physics and galactic astronomy. ***Do you agree? Is this is a useful sequence to include along with the Big Science of CERN and the Hubble Space Telescope?*** (See also the web video about Alan's Harpswell NGO, "Empowering Women in Southeast Asia.") ***How would you compare Sothearath's use of science for practical purposes to directly help human beings with Fabiola's or Darota's use of science to discover the smallest particles of nature, without any apparent practical application? Which use is more important? Which use should receive the greater financial support?***



PART 3 SYNOPSIS

HOMO TECHNO

Part 3 opens with Alan asking neuroscientist Robert Desimone if we will ever understand the brain well enough to predict whether two particular people will fall in love? Desimone answers: our current models "would say there's a 70% probability you'll fall in love with Mary, and a 40% chance you'll fall in love with Alice." Lightman decides to tune in to one square inch of soil. Through a magnifying glass he examines the bugs and ants in a patch of ground. Musing in his study, Lightman finds that Ernest Withers' "I Am a Man" photograph, taken during the 1968 sanitation strike in Memphis, reminds him that dignity is part of human nature. Alan wonders what future humans will be like, as we evolve from *Homo Sapiens* to *Homo Techno*, part human and part machine. Near Los Angeles, he visits Erik Sorto, paralyzed from the neck down during a gang shootout and the first human to have electrodes implanted into his brain allowing him to control a robotic arm by pure thought—a true cyborg. Alan speaks with Erik about what makes us human. Lightman asks Nobelist Rai Weiss and his colleague Nergis Mavalvala, the first woman to serve as Dean of Science at MIT, what kept them going for the 40 years needed to build LIGO, the first instrument to detect gravitational waves. "Pleasure," says Weiss. In a breathtaking final scene, Lightman stands on the freezing platform of the Sphinx Observatory, 12,000 feet high in the Alps of Switzerland, and comments that just as his atoms were born in stars, after his death they will mix with the soil, oceans, and air and eventually become parts of other people. "Backwards in time, into the far distant past, and forwards in time, into the far distant future, we connect. We connect."

PART 3 DISCUSSION PROMPTS

1. Neuroscientist Robert Desimone calls himself a "reductionist" and sees no reason future brain science could not study two people's brain activity and predict whether they would fall in love. Philosopher of science Rebecca Goldstein disagrees, even though she believes, like Alan, that there's a material cause for everything. ***What do you think? Have you or your friends had success with dating apps in terms of predicting relationships? Does that make Robert or Rebecca's argument stronger or weaker?***

2. In what we call the "Ants" sequence, echoing a chapter in his "Searching for Stars on an Island in Maine," Alan takes a break from astrophysics and brain science and spends time concentrating on "One Square Inch" of ground. (SEARCHING also offers a hands-on, inquiry-based activity as a companion to this sequence.) Like Henry David Thoreau, Alan finds walking in the woods an essential counterpoint to the "push and heave" of an increasingly digital world. (A chapter in his most recent book, *The Transcendent Brain*, expands on E.O. Wilson's concept of biophilia and provides scientific background on the therapeutic value of nature.) ***How does exposure to nature make you feel? Do you try to take your family to wild places? If you live in a city, do you make an attempt to spend time in the countryside?*** Many of the modern communication devices, such as smart phones, have put layers of separation between us and direct contact with nature. Yet these devices have obvious benefits. ***How can we live a life in the modern, wired world and yet retain direct experience with nature?***

3. The economist John Maynard Keynes is quoted as saying "In the long run we are all dead" and Alan extends that to say that at some point entropy will win out, all the stars will burn out, and there will be no energy left in the universe, and no life nor consciousness will be possible. ***What will have meaning in that distant future?*** Philosopher Rebecca Goldstein answers, "Why is that time any more important, that time in the future when it's a cold, dead universe? Why is that any more important than right now? Why should I judge now by the standards of that time? I'm going to judge now by the standards of this time, and be wondrously grateful for it. I feel kind of grateful that I got to exist and got to participate in the life of humanity." ***Do you agree? What is it that gives your life meaning?***

4. Erik Sorto was a gang member in LA, and was paralyzed in an ambush that may have been a revenge attack. After years of depression, he found new meaning in his life, first by writing "Payback," a book he hoped might prevent other young people from getting involved with guns and crime, and then by volunteering to be part of an experimental research project that involved the risky implantation of electrodes in his brain. In part 3, and in an extended web video, Erik explains his participation in the project, and while—although a real-life cyborg while the implants were in place—he still felt fully human. ***What qualities would you want to see retained as humans rely more and more on machines and AI? Does that make you optimistic, or pessimistic about the future of Homo Sapiens as we evolve into Homo Techno?*** (Erik's surgeon, Dr Charles Liu, and lead researcher, Dr. Richard Andersen, provide more background on the project in another web video.)

5. In Bern, Switzerland, Alan visits the apartment where young Albert Einstein worked on his revolutionary theories of space and time in 1905. Alan speculates that some of the atoms Einstein breathed might remain in the room. ***Does that sound like poetry, or scientific fact?*** (There are, in fact, several sites that claim to be able to calculate how many molecules from, say, Julius Caesar, we inhale: Ceasar's Last Breath. See also Alan's argument about his atoms becoming parts of other people in the final sequence of part 3, "Atoms Everlasting." (Alan Lightman notes that he has done calculations exactly like this one, and it is correct given the assumption that all our atoms end up in the atmosphere. Surely some of our atoms end up in the soil and the oceans, and it is hard to do a calculation of the percentages ending up there. However, if as little as 1% of your atoms end up in the atmosphere, you would certainly breathe in some of Caesar's atoms in a lifetime.)

6. Albert Einstein is regarded as perhaps the 20th centuries smartest human, and perhaps only rivaled by Isaac Newton in modern human history, (See Alan's Rumination.) But while he realized that his new theory predicted the existence of gravitational waves, he also thought they would be too weak to ever be detected. It was the detection of neutron stars and black holes, after Einstein's death, that showed there were objects small and dense enough to create such waves. ***Does that make Einstein any less smart? What do you think Einstein would say if he came back today and saw LIGO? What other "impossible" things might prove feasible? Faster than light travel?*** (No.) ***Time travel?*** (No.) ***What "impossible" thing would you most like to find possible?***

7. Two of the most dynamic characters in SEARCHING are Rai Weiss and Nergis Mavalvala, both key figures in the success of LIGO, the Laser Interferometer Gravitational-wave Observatory. In this sequence they explain the complex instruments required to detect phenomenally small fluctuations in spacetime, but also share the human motivations that kept them at work for decades before results were detected. ***Why do you think they were motivated to work on the project so many years? Have you ever worked on a project for a decade or more, without knowing whether it would succeed? If so, what motivated you?***

8. In part 1, Jack Szostak argues that emergent phenomena (the interaction of simple processes leading to complex results) is at work both in biology and how our brains work. In part 3, Alan elaborates on this idea in a sequence showing how some species of fireflies start blinking separately, but eventually synchronize, and how simple rules explain how starlings swirl in a murmuration, and how blind termites create mud "cathedrals." ***Can you think of other examples? (Such as musical fugues?)***

9. The "Atoms Everlasting" sequence concludes part 3, referencing several of the people, places and scientific projects seen throughout all three programs, from the cave in France, to distant galaxies, particle physics and brain science. But as he ends his/our "quest for meaning" Alan says, "Whatever this strange universe we find ourselves in …we're part of it. We're connected. That's meaning for me. And there's something else: Galileo's law for pendulums, Einstein's law for gravity… Although our single lives are flickers in the depths of time and space, the laws of nature we have found will last forever. And that's a type of immortality." ***Do you agree? How would you define "meaning"? How has the science presented in SEARCHING influenced your sense of how and where you fit in the universe?***

FINAL THOUGHTS

As Alan once stated in a "This I believe" essay:

> *"Einstein once wrote that 'the most beautiful experience we can have is the mysterious. It is the fundamental emotion which stands at the cradle of true art and true science.' What did Einstein mean by 'the mysterious?' I don't think he meant that science is full of unpredictable or unknowable or supernatural forces. I think that he meant a sense of awe, a sense that there are things larger than us, that we do not have all the answers at this moment. A sense that we can stand right at the boundary between known and unknown and gaze into that cavern and be exhilarated rather than frightened.*
>
> *One of the Holy Grails in physics is to find the so-called 'theory of everything,' the final theory that will encompass all the fundamental laws of nature. I, for one, hope that we never find that final theory. I hope that there are always things that we don't know—about the physical world as well as about ourselves. I believe in the creative power of the unknown. I believe in the exhilaration of standing at the boundary between the known and the unknown. I believe in the unanswered questions of children."*

We hope that SEARCHING has moments of awe and wonder, a little bit of art and lots of new science. Please sign up for the SEARCHING newsletter (see link in the footer of our website) which will have updates on the project and some live and in-person events through the end of Spring 2023. Thanks for being part of the conversation!

Watch Party Feedback Form | Alan Lightman's Publications | SearchingForMeaning.org

APPENDIX

MATERIALS TO PROMOTE YOUR WATCH PARTY

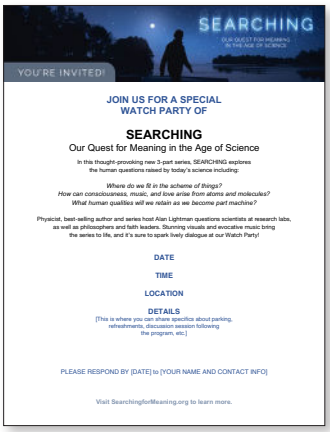
DOWNLOAD ASSETS HERE

PRINT MATERIALS

Large event banner, poster and letter-size flyer provided as print quality PDFs and web optimized JPGs. The Invitation and 2-Sided Flyer are also provided as a Word doc.

Website may be replaced with your event's date/time/location.

Invitation 8.5"x11"



SEARCHING_WATCH PARTY INVITATION.doc

Poster 24"x36"

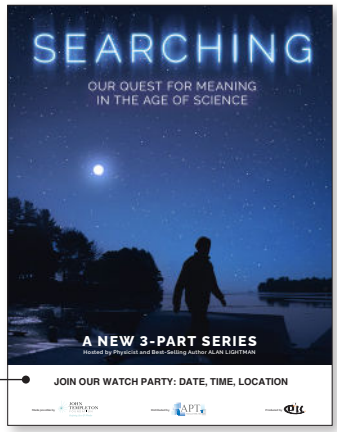
SEARCHING_SQAS_24x36_POSTER.zip

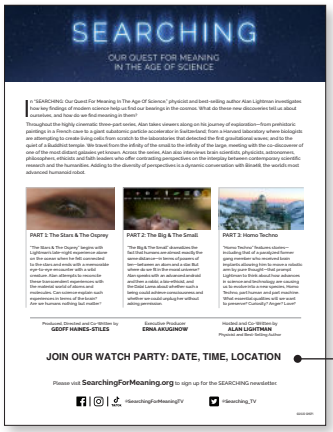
Imprint area for your Watch Party info.

Event Banner 33"x78"

SEARCHING_SQAS_VertBanner.jpg

2-Sided Flyer 8.5"x11"





SEARCHING_SQAS_8.5x11_Flyer.zip

Imprint area for your Watch Party info.

DOWNLOAD ASSETS HERE

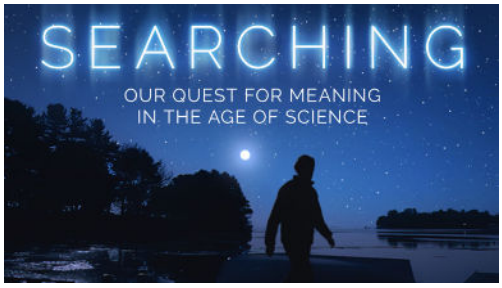
DIGITAL MATERIALS

Digital poster images available as web optimized JPGs.

Show Poster 2000x3000

SEARCHING_SQAS_Show_Poster_2000x3000 R3.jpg

Mezzanine 1920x1080



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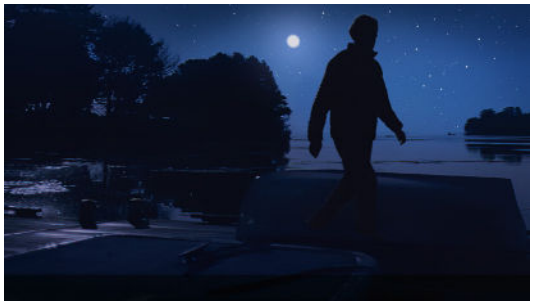
Show Background 1920x1080



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Show Logo

SEARCHING
OUR QUEST FOR MEANING
IN THE AGE OF SCIENCE

SEARCHING_SQAS_Logo_vector.eps
SEARCHING_SQAS_Logo.png

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DIGITAL MATERIALS

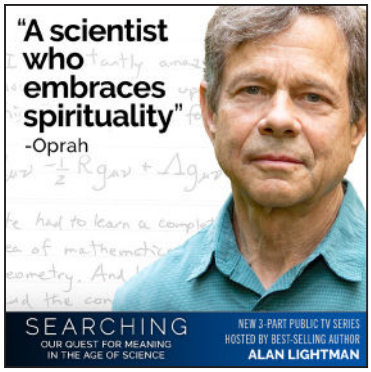
SOCIAL MEDIA THEME: **WATCH PARTY & BIG QUOTES**

SEARCHING_SQAS_SM-WATCHPARTY

CAPTION: Join my WATCH PARTY on (DATE)!
(DM me for more details.)

Best-selling author and physicist Alan Lightman hosts "SEARCHING: Our Quest For Meaning In The Age Of Science". This fascinating new 3-part series examines the intersection of science and spirituality through engaging conversations with top scientists and thought leaders. We invite you to watch with us, then continue the conversation.

#SearchingForMeaningTV #Science #Documentary #BigQuestions #AlanLightman



SEARCHING_SQAS_SM-ALQuote-1

CAPTION: Join my WATCH PARTY on (DATE)!
(DM me for more details.)

Best-selling author and physicist Alan Lightman hosts "SEARCHING: Our Quest For Meaning In The Age Of Science". This fascinating new 3-part series examines the intersection of science and spirituality through engaging conversations with top scientists and thought leaders. We invite you to watch with us, then continue the conversation.

#SearchingForMeaningTV #Science #Documentary #BigQuestions #AlanLightman #Oprah

SEARCHING_SQAS_SM-ALQuote-2

CAPTION: Join my WATCH PARTY on (DATE)!
(DM me for more details.)

This new 3-part series investigates how key findings of modern science help us find our bearings in the cosmos. We will continue to examine the ideas explored by Alan Lightman through our guided discussion after the program. I hope you'll join me!

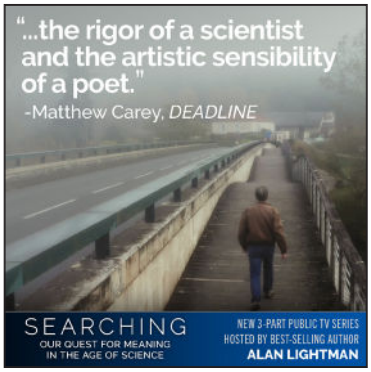
#SearchingForMeaningTV #Science #Documentary #BigQuestions #AlanLightman #Oprah

SEARCHING_SQAS_SM-ALQuote-3

CAPTION: Join my WATCH PARTY on (DATE)!
(DM me for more details.)

Let's take this thought-provoking journey together as Alan Lightman seeks to answer the deep questions about the meaning of our existence, and explores what science is bringing to the conversation.

#SearchingForMeaningTV #Science #Documentary #BigQuestions #AlanLightman

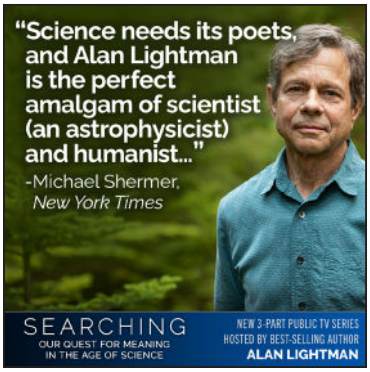


SEARCHING_SQAS_SM-ALQuote-4

CAPTION: Join my WATCH PARTY on (DATE)!
(DM me for more details.)

Are we just atoms or something more? Where do we fit in the grand scheme of things? This new 3-part series explores the big questions humans have asked for all time. Let's watch the series together, then, as a group, explore those big questions in a guided discussion.

#SearchingForMeaningTV #Science #Documentary #BigQuestions #AlanLightman



SEARCHING_SQAS_SM-ALQuote-5

CAPTION: Join my WATCH PARTY on (DATE)!
(DM me for more details.).

This new 3-part series examines the intersection of science and spirituality through engaging conversations with top scientists and thought leaders. Join me in watching the series, and continuing this important conversation through guided discussion.

#SearchingForMeaningTV #Science #Documentary #BigQuestions #AlanLightman

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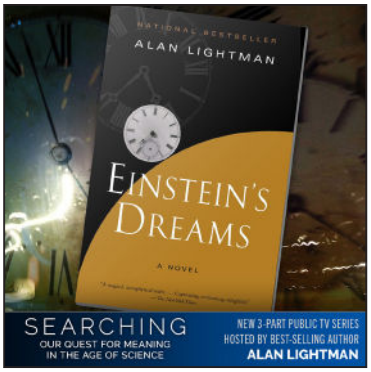
DIGITAL MATERIALS

SOCIAL MEDIA THEME: **ALAN LIGHTMAN BOOKS**

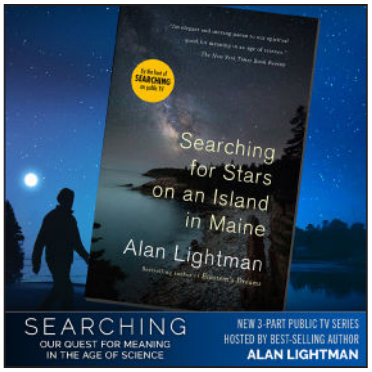


SEARCHING_SQAS_SM-ALBook-1

CAPTION: CAPTION: Join my WATCH PARTY on (DATE)! (DM me for more details.)

Watch Alan Lightman, physicist and author of "Einstein's Dreams" as he explores the intersection of science and spiritualty in "SEARCHING: Our Quest For Meaning In The Age Of Science", a new 3-part series. We invite you to watch with us, then continue the conversation.

#SearchingForMeaningTV #Science #Documentary #BigQuestions #AlanLightman @PantheonBooks

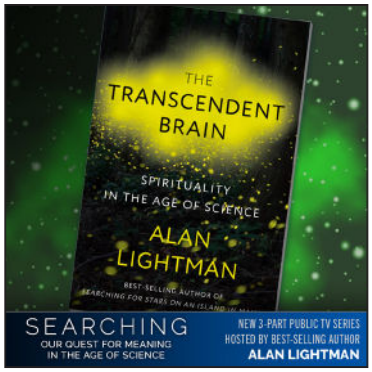


SEARCHING_SQAS_SM-ALBook-2

CAPTION: CAPTION: Join my WATCH PARTY on (DATE)! (DM me for more details.).

Alan Lightman's book "Searching for Stars on an Island in Maine" inspired the new 3-part series "SEARCHING: Our Quest For Meaning In The Age Of Science". This new 3-part series examines the intersection of science and spirituality through engaging conversations with top scientists and thought leaders. Join me in watching the series, and continuing this important conversation.

#SearchingForMeaningTV #Science #Documentary #BigQuestions #AlanLightman @PantheonBooks



SEARCHING_SQAS_SM-ALBook-3

CAPTION: CAPTION: Join my WATCH PARTY on (DATE)! (DM me for more details.)

We'll journey with physicist and author Alan Lightman as he explores the intersection of science and spiritualty in "SEARCHING: Our Quest For Meaning In The Age Of Science", a new 3-part series.

Also watch for his newest book "The Transcendent Brain: Spirituality in the Age of Science" coming soon.

#SearchingForMeaningTV #Science #Documentary #BigQuestions #AlanLightman @PantheonBooks

TWITTER POSTS

Use the art from any of the FB and IG provided posts. Create your own 280-character caption or select from these suggestions:

TWEET 1:

Are we just atoms or something more? Come find out at my WATCH PARTY for "SEARCHING: Our Quest For Meaning In The Age Of Science". Reach out for details.

#SearchingForMeaningTV #Science #Documentary #AlanLightman

TWEET 2:

WATCH PARTY for "SEARCHING: Our Quest For Meaning In The Age Of Science", a new series exploring the human questions raised by modern science. Reach out for details.

#SearchingForMeaningTV #Science #Documentary #AlanLightman

TWEET 3:

In "SEARCHING" physicist and author Alan Lightman investigates how key findings of modern science help us find our bearings in the cosmos. JOIN MY WATCH PARTY!

#SearchingForMeaningTV #Science #Documentary #AlanLightman

TWEET 4:

Where do we humans fit in the grand scheme of things? Let's find out at my WATCH PARTY for "SEARCHING: Our Quest For Meaning In The Age Of Science".

#SearchingForMeaningTV #Science #Documentary