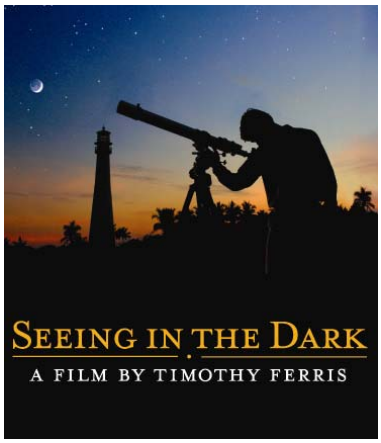


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# A Conversation with Timothy Ferris

**Author and Filmmaker, *Seeing in the Dark***

Stargazing is the subject of *Seeing in the Dark*, a 60-minute, state-of-the-art, high-definition (HDTV) documentary by Timothy Ferris that premieres September 19, 2007 at 8:00 p.m. on PBS (check local listings). An award-winning author, journalist, filmmaker, and an avid amateur astronomer for more than 50 years, Ferris has presented two other PBS specials – *The Creation of the Universe* and *Life Beyond Earth*.

**Q: Why do humans gaze at the stars and take up amateur astronomy?**

**TF:** I think it's healthy for people to understand their wider environment. The world's a lot less troubling when you understand the systems that it's part of, in the huge scope of space and time in which human life exists. People ask, "Doesn't this make you feel insignificant, that everything out there is so big?" But I really think the reverse is true, that one feels much better about the human condition when one understands it in its natural context. That context extends out through the stars and the wider universe. It's all nature, and it's always good for the mind and heart to understand nature and our place in nature. That's what stargazing is all about.

**Q: What inspired you to put so much effort and thought into producing *Seeing in the Dark*?**

**TF:** Stargazing's a beautiful subject. I don't know any sight in nature that's more inspiring than a dark, star-filled night sky, and I wanted to make a film that would do justice to the aesthetics of stargazing. I don't believe it's ever been done. We had to enlist a lot of technical leverage to try to give you something of the feeling of being out there. One of my ambitions, from early on in the film, was to create scenes in which the sights, sounds and ambiance would give you a sense of what it's like to be out stargazing at night.

**Q: Is astronomy accessible to the general population?**

**TF:** One of the great things about stargazing is that it's immediately at hand for so many people. The stars are always up there. Even from a light-polluted location, using a little effort with binoculars or a small telescope, there's usually something you can see -- even if it's only the rings of Saturn or the moons of Jupiter. And kids can get into it. You can enjoy stargazing just by going out and learning a couple constellations with your kids. It is a genuinely infinite subject in which there is no limit to how much one can learn.

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**Q: How far, on a clear night, can you see out into space?**

**TF:** On a clear night, you can see pretty much forever. You can see quasars five billion light years away; that's light that's older than the Earth. It's easy to image and also to see galaxies that are hundreds of millions of light years away. To get from the middle of a city -- from Times Square in Manhattan to a site that's dark enough that you can have a lot of fun and see stuff with a small telescope -- is often less than an hour's drive. So it is possible to get out there, and there's tremendous happiness and satisfaction in taking advantage of this fact and having a look at nature on the big scale.

**Q: What are we looking at when we look out into deep space and don't see something?**

**TF:** Anywhere you look on the sky, there's something. If it looks empty through a given telescope, a bigger telescope or a long-exposure image through that telescope will show you galaxies there. There's stuff in every direction, at different distances out. The Hubble Deep Field shows thousands of galaxies in an area on the sky smaller than your little fingernail at arm's length. Everywhere you look, there are thousands of distant galaxies in every tiny little bit of the sky. There are at least a hundred billion galaxies out there, and hundreds of billions of stars in each galaxy. The potential for learning about the universe is virtually unlimited.

**Q: Most films, when they try to teach science, tend to instruct, and place a narrator between the subject and the viewer. *Seeing in the Dark* approaches that differently**.

**TF:** If you're going to look through a telescope, you don't want an expert to step in between you and the telescope and give you a lecture. At the most, as you look through the telescope, you might like a guide to whisper in your ear a few things about what you're seeing. It's a shift that has been talked about in educational terms as a shift from the paradigm of the "sage on the stage" to the "guide at your side." The basic dynamic of the film is that you're looking out there, and I'm trying to help make that experience meaningful by telling you a little about what you're seeing and how you're seeing it.

**Q: In *Seeing in the Dark*, you talk to the viewer through amateurs, which creates a much less intimidating feeling for the viewer.**

**TF:** I think it's great that Robert Smith, a former NFL running back, is the chief exemplar of the scientific approach to the world in our film. Robert started out in mathematics, but came to broaden his interest to embrace science more generally. He points out in the film that science is not a matter of learning a lot of facts. It's simply understanding that to take an idea seriously, it has to be a testable idea. That simple step, which has been a huge step in human history, is still unknown to the majority of the human species.

**Q: *Seeing in the Dark* opens and closes with imagery of water. What's the connection?**

**TF:** The surface of the pond resembles the surface of the sky. You can look *into* it, and there are all sorts of strange denizens of those depths. I was reminded of the cycles of human life since we shot this film starting 50 years to the month after I'd gotten my first telescope. The cycle of different generations, the symbol of water running through time, and the association of music -- all those elements are bound up in these scenes. They all go into real life, and the real experience of the real people that are out there looking at the stars.

**Q: Do amateur astronomers fill a scientific need?**

**TF:** New telescopes are coming online all the time, and most of them are amateur telescopes. Every serious amateur astronomer that gets into some field of scientific research adds to the total data-gathering capacity of the planet. Recently the astronomical data-gathering rate has been doubling about every 14 to 18 months. We can't keep that going on forever, but there's a very healthy increase in the number of eyes that the Earth has trained on the rest of the universe.

**Q: I've read about averting your eye off the center when you're looking at an object. Can you explain that?**

**TF:** If you look directly at a dim object through a telescope, you won't see it to the best advantage. The way the eye is constructed, it sees dim things best not at the center but a little bit off-center. So you need to look just a little away from the object you want to see, and you will instantly see that it comes out much more vividly. This is typically true with galaxies and nebulae. It's called averted vision, and it takes a little getting used to.

**Q: What is dark adaptation and how does it affect viewing of the night sky?**

**TF:** When you walk out of a bright room, your eyes do not immediately adjust to the darkness. You'll look up and see perhaps five or six stars, because your eyes have been dazzled by the bright lights indoors. It takes about twenty to thirty minutes for your eyes to adjust to the dark -- to become what's called dark-adapted. If you'll give it that time, you may see a thousand stars. Even a brief exposure to light will re-set your eyes back where they were, so if you've taken time to get dark-adapted, avoid even brief exposure to bright light.

**Q: If someone wanted to use binoculars to stargaze, what would you recommend they get?**

**TF:** The best choice, to get started stargazing, is a pair of borrowed binoculars. Nothing will show you quicker what works for you and what you like. If you're interested in getting a telescope, go to a public stargazing session of your local amateur astronomers. Many have public nights, typically once a month at the dark of the moon, and you can go out and see what things look like through different telescopes and learn how it is to use different telescopes. A little time spent like that can save you money later on.

**Q: What would you say to people who are thinking of getting into stargazing but don't know where to start or what to do?**

**TF:** If you're interested in getting into stargazing, one prospect is to make use of the *Seeing in the Dark* Web site www.pbs.org/seeinginthedark, going online prior to the September airdate]. It was constructed as a tool to get started in stargazing and to provide support at any subsequent level. We're here to help, and so are plenty of other people, many of whom are linked to our Web site. I think the main thing is to learn something and have fun.

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