

Science AMA Series: We're David Pogue, tech guru and host of 16 NOVA programs, and Chris Schmidt, NOVA senior producer. Today, we launched NOVA's first crowdfunding campaign, because we think involving people in science is important. Ask us anything!

Beyond the Elements¹ and r/ScienceAMAs¹

¹Affiliation not available

April 17, 2023

Abstract

Hi, everyone! I'm David Pogue—former New York Times tech columnist, current Yahoo tech critic, and—most importantly for today's conversation—the host of 16 NOVA programs that have aired on PBS! Some of those include the MAKING STUFF and MAKING STUFF 2 series, and the two-hour HUNTING THE ELEMENTS movie: a crash course on the periodic table that over 10 million people have watched so far. Today, we're embarking on a Kickstarter journey—not only to make a sequel to HUNTING THE ELEMENTS, called BEYOND THE ELEMENTS, but to gain a deeper connection with NOVA's audience. We think that more engaging science programming can be a key to generating public excitement for science and scientific discovery. I've also got Chris Schmidt with me. He's a Senior Producer at NOVA, with decades of award-winning science television under his belt. (Chris's IMDB page) He's done a ton of stuff at PBS, Dreamworks Animation, The Discovery Channel, History Channel, National Geographic, Animal Planet, and others. He'll be producing and directing BEYOND THE ELEMENTS. Together, we've had some wild adventures making documentaries that attempt to engage all levels of science lovers. We're here to talk about making science television, the importance of science literacy, and the role that media plays in educating the public about science. And about how we think the audience should be part of it all! Ask us anything! Watch our latest doc, SEARCH FOR THE SUPER BATTERY, tomorrow, February 1, at 9/8c on most PBS stations. (Check your local listings to confirm.) And check out our Kickstarter campaign to Make Science for All! #scienceforall 1:36 PM ET: We're here people! Looking forward to answering your questions. Here's the proof (for science!): <https://youtu.be/T2cu-1jiki0> 2:43 PM ET: Answering diligently! Planning on being around for another 90 mins or so! 4:27 PM ET: Thanks for all your questions! We'll be checking back in over the next 24 hours and following up if you have more for us. In the meantime, lets Make Science for All!

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BEYOND_THE_ELEMENTS [R/SCIENCE](#)

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CORRESPONDENCE:

DATE RECEIVED:

February 01, 2017

DOI:

10.15200/winn.148587.70640

ARCHIVED:

January 31, 2017

In addition to NOVA, I really enjoyed Nova Science NOW. Why was it canceled? Any thought of bringing it back?

[VoltaicGlitch](#)

Pogue sez: I don't think it's been canceled, exactly. It's my understanding that it's just really hard to get funding, especially for a multi-part series like "NOVA ScienceNow." NOVA shows are funded mostly by gifts, grants, foundations, and, of course, viewers like you. And that all takes time and a lot of effort.

That's one reason we're experimenting with Kickstarter--we launched today, in fact, a campaign to

CITATION:

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2017 , DOI:
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raise money directly from the public! Here's hoping you'll check out our campaign at [novakickstarter.com](https://www.novakickstarter.com). It's a VERY cool project!

Many of your Nova specials have been funded by the Koch brothers. Isn't that like making a deal with the devil? Do they have any input on your programs?

[astro-nerd](#)

CHRIS: First of all -- NOVA maintains a strict editorial firewall between funders and those of us who are greenlighting and overseeing our films. That means that, like all funders, the Koch Fund For Science has no input whatsoever into our programming.

That said, we do our very best to be even-handed and fair minded in our programming. We seek first and foremost to serve our viewers' interests and needs. (Our films are obsessively fact-checked, and in the rare instances where we get a fact wrong during broadcast, we always return to fix the program for later broadcasts.)

Of course, when it comes to the subjective judgement of viewers and of ourselves -- especially regarding hot-button or controversial topics -- we try to foster open dialog and create an environment where all feel welcome to share their views, whether that be on our Facebook site, Twitter feed or via email or even snail mail. We care deeply about our mission and how well we are attaining our goals.

Now as for the deal-with-the-devil question. The Koch foundation (to my knowledge) has never sought to inject any editorial point of view into our programming -- overtly or covertly. We believe that we are an excellent investment for anyone who is willing to support our quest to tell stories of scientific inquiry and discovery.

Will there ever be a crossover episode of my two favorite PBS shows, Nova and This Old House?

[Nuroman](#)

Pogue sez: Why, yes! How did you know? We've just started work on three new NOVA/OLD HOUSE shows: "The Molecular Basis of Foam-Sprayed Insulation," "Walnut Banisters of the Roman Empire," and and "Climate Change, Walk-in Shower Stalls, and You."

Just kidding.

NOVA and PBS in general seem so important as a resource for people who do not have access to top tier schools, after school programs, well funded libraries, unlimited data, etc. All of the fantastic streaming content is only as good as your internet or data plan. If you're primarily accessing the internet via a mobile device and have metered data, you aren't able to watch hours of youtube videos. Free public broadcasting with educational content seems vital for underprivileged communities.

If PBS is no longer funded, what can we do to replace it?

[firedrops](#)

Chris here.

Part of NOVA's long-standing mission is to make science content accessible to everyone regardless of locale or socio-economic status. CPB (which funds PBS) funds many local PBS member stations to enable those in lower-income communities to be able to license and broadcast all PBS content. Making our programs diverse and accessible to everyone is actually written into the PBS charter, so we take it

VERY seriously.

If CPB (the direct recipient of congressional funds) were unfunded, many stations may not survive and if the network were to lose too many stations (besides the problem that would create in leaving behind a network that did not equally serve all constituents) -- the entire network could lose critical mass and not survive. So IF CPB funding were to disappear, the first and MOST important way to respond is to POUR money into member stations, particularly those in smaller or underserved communities, because you're right, public broadcasting is essential if we want everyone to have equal access to this kind of content!

(This is my personal take -- not an official policy statement, FYI.)

One problem I've noticed is that many people are casually exposed to science at a "Gee whiz, isn't that cool" level, but never get deeper (think, [IFLScience](#), and other places like that, which focus on sensationalism above substance). What can be done to get people to actually engage at a greater level with genuine science?

[kerovon](#)

CHRIS: That's a great question! The reality is that an hour of TV can not deliver a huge amount of information. Part of the art of this stuff is to be able to inhale a huge amount of information, wrap it in a narrative and then feed it back as a great story -- all without confusing anyone or losing them. NOT easy! (For me anyway, maybe some genius finds it easy -- if so, I officially hate them...)

So to answer your question, I think that the best thing we can do is to try to portray the scientists and their work as much or more than we deliver the headline of the discovery. Hopefully getting that backstage pass will do more for science-lovers and viewers than merely delivering a sensationalist "cool" factoid. That said, we can never really do it justice so I often say to people: "all we can do is stand you on a beach, point across the water and say: 'somewhere over there is a land called materials science [or geology, or Pluto or vaccines...]. I can sketch the outline of the shore for you, but if you want to know more you will have to sail over and bushwhack for yourself!'"

PLUS we work hard to bust out all kinds of ancillary materials. Check out our blog NOVA Next, PBS Learning Media (where we deliver content to teachers), Gross Science (short form videos that deliver what the name promises), What the Physics (ditto) and more...

POGUE: Pogue here. Well, you have to START with something cool, just as with anything you want to teach.

You don't learn to play piano by hearing someone play "Chopsticks"; you get inspired by a great performance. When you consider becoming a doctor, you think about the end result—being a doctor!—instead of longing to take organic chemistry. When you're getting interested in learning a language, you pick up the swear words first. (Well, some of us.)

So I'm a huge believer in presenting a new topic—science, in this case—with an entertainment ingredient. I doubt "Hunting the Elements" would be palatable in thousands of science classrooms each year without the humor, the cool stuff, and a few explosions.

Bottom line: First you grab their interest. THEN you can enroll them in organic chemistry.

Are you afraid that the Trump administration will find a way to defund PBS, NPR, and other public knowledge sources?

[cjfman](#)

It would be a terrible shame if congress were reconsider its support of CPB -- that would be a major departure from a 60+ year history of support, which has been supported by both major parties.

That said, maybe I can answer this in light of our current Kickstarter campaign. This is an excerpt from a letter I'm sending to friends:

"We've been pushing toward a January 2017 launch date for our crowd funding campaign for many months in hopes that we could excite potential fans and backers to go along for a really fun ride with us on the production of a new 2-hour special *Beyond The Elements*, hosted by our pal David Pogue.

In a surprising twist that I think none of us working on this could have predicted, current events have completely overtaken us.

We now realize that we have just embarked on a mission that is of more critical importance than just backing a TV show; a mission to promote the de-politicization of science and to support openness in our society when it comes to talking about everything from the cosmos, to the natural world, to biology and of course, ourselves as humans — the ambitious, hopeful and optimistic stewards of the planet that we strive to be in our best moments.

From time to time, science and scientists come under political attack. Also, from time to time public media comes under political attack. This seems to be a time when both are actively threatened.

On the public media front, here's a [recent article that appeared in Current](#) that highlights the worry of the moment.

As I suggested above, this is not a new initiative. During the 2012 election, Mitt Romney famously suggested that "Big Bird would survive" if the government pulled funding for public broadcasting. While I understand our ex-governor's point and I do believe in the power of the free market, the truth in this case is much, much more complicated.

In fact, at the time Romney made this statement, I felt moved to write a blog piece that considered this claim. It's 4 years old but it's still valid and I include it [here](#) (there are a few things that are slightly outdated but it still holds up).

All of us working in public media will continue to try to be a source of unifying rhetoric and to serve the entire public -- without exception."

Of course we're hoping that the public agrees that our work and mission are worthy. Thank you for asking that question.

Thanks for joining us Chris and David! What are the most exciting or unexpected things you've learned or filmed during your time working for NOVA?

[p1percub](#)

Pogue sez: I've now hosted 16 hours' worth of NOVA shows, which have taken me around the world to meet some of the most amazing scientists. I mean, JAW-DROPPINGLY brilliant people.

The most unexpected things I've learned are that (1) over the past 20 years or so, scientists have gotten a lot better at communicating in plain English. Some of them even get training in grad school for presenting to the public and speaking on camera.

(2) Our national electric grid is screaming out for BATTERIES. Insiders know this, but laymen like me do not! When you turn on your faucet, the water has just been waiting there in the pipe. But when you turn on your LAMP, that electricity has to be generated on demand--right now.

Trouble is, we, the people, use energy at wildly different times. As we come home from work, we strain the grid to the breaking point as we turn on air conditioning and lights en masse. Then at night, almost nobody's using juice--power plants literally BURN OFF excess electricity they can't use!

By adding batteries to the grid, we could even out the supply and demand. Maybe more importantly, we could even out the output of SUN and WIND power--we could capture the wind at night, when it blows most, and use it during the day. But you can't really use regular lithium-ion batteries; they're too expensive and don't last long enough. So people are experimenting with things like energy storage based on gravity, ice, and flywheels.

Anyway, I learned all this shooting "Search for the Superbattery," which airs tomorrow night on NOVA (Weds, Feb 1, 9pm ET)!

(3) When we mine for gold, we no longer hope to find chunks of gold. No more "eureka! I've found it!" moments. Instead, the gold in our mines comes in microscopic flecks. In ONE truckload of 70 tons of ore, they're ecstatic if they find ONE OUNCE of gold!

And yet at today's gold prices, it's still a really great business. :)

(That one I learned shooting "Hunting the Elements," which you can watch [here](#).)

What is the selection proceeds for how you choose the topics for a season of shows? Is there a desire to have a mix of physics, engineering, archeology, or do new big discoveries drive the agenda?

Thank you so much for what you do! My 7 year old begs to watch Nova with me, and I hope it inspires him to work in the sciences.

[SuperSpikeVBall](#)

CHRIS: That's a great question! Our films generally fall into a categories like geology, natural history, physics, chemistry, history, technology, engineering ... and there's plenty of overlap. We don't specifically determine in advance that we need X geology shows or Y physics shows -- instead our process is much more dynamic and responsive to a whole bunch of different variables and inputs. We are an anthology science documentary series and with only a few exceptions in recent years all of our films are made by trusted filmmakers, who know how to tell the kinds of stories we believe our viewers crave and enjoy.

Sometimes a topic or a science story will clearly be timely or newsworthy and we'll jump on it: "The Big Bang Machine" for example told the story of the discovery of the Higgs Boson. On the other hand, a film like "Hunting the Elements" or (hopefully) "Beyond the Elements" are considered to be important general interest topics that seek to tell stories and explain topics and ideas that we all encounter in our lives as curious citizens and consumers of information.

Sometimes a producer will bring us an idea that we haven't thought of or developed and we'll partner with them to produce the film. Other times the idea is ours and we reach out to a partner that we believe would do a great job telling that story and making an exciting and entertaining film. And, in this case, the idea actually came from NOVA viewers -- so we're hoping to see this succeed. That, in a nutshell, is how the sausage gets made! Hope it's helpful.

Micheal Faraday wrote his discoveries in plain english. Knowledge exploded around his ideas. Maxwell advocated explaining natural science using mathematic and most advance research and knowlege has become opapaque since. Now I believe math is necessary, Im an engineer. But it seems that being able to clearly explain phenonema in plain language is at least as important as mathematics. Even

Einstein used "thought experiments" that didn't necessarily use math.

So why, really is modern science so unapproachable by most people? Have we built a priesthood?
Sorry, that was two questions...

[Ecgasco](#)

Pogue here. I agree that science has become increasingly frightening to many people. My theory is that rapid advances are tapping into something primal in us: fear of the unknown. We no longer UNDERSTAND our world-- our car engines, our televisions, our phones, our medical treatments--and that's terrifying.

Frankly, that's what gets me up early in the morning on NOVA shoot days. I know that once someone takes the time to explain these concepts, they won't seem UNFAMILIAR, and therefore won't be frightening.

And it's a worthy crusade. I'm sure it's no shocker to anybody that science is our only way out of humanity's problems--climate, disease, hunger, energy, dropped calls. Without progress in science, there won't be progress at all.

Some of my favorite science documentaries are series that start off basic, but get more advanced as they progress. I'm particularly drawn to chaos theory, quantum physics, and math documentaries that explain cutting edge science. I suck at math, but it's still fascinating to watch series like Atom (BBC), Dangerous Knowledge (BBC), and other documentaries that explain the ideas of what these researchers are after. They are trying to peer into the void, as the saying goes. The mystery of all this is intoxicating, but tricky to communicate. Do you have any plans for programming that is a little more challenging to the viewer on any science subject?

[magtig](#)

CHRIS: Well, if you like math, please check out The Great Math Mystery. This film is a real gem and recently won a Writer's Guild Award for documentary, a Cine Golden Eagle and was nominated for an Emmy. I guarantee it won't disappoint!

As for more challenging to the viewer -- I refer you to an answer I just typed that used the distant shore metaphor. We are always walking a tightrope between being challenging and also inclusive. We don't ever want to turn off the curious viewer who ends up feeling that we are pitching our content at a level that's too tough to follow. But we also want people like you to be excited and challenged.

What I can promise is that we will continue to try to tackle as many and as varied topics as we can fit into a season of TV. We hope you will continue to support us with your eyeballs and (cough, cough) by backing our Kickstarter campaign!

Hello!

I loved watching NOVA as a kid, so thanks for making such an awesome show! What was your favorite episode of NOVA that you produced?

[rseasmith](#)

CHRIS: Oh man, that's tough! I need a filter on that question! Favorite location on a film I made ("Making Stuff Stronger") with David when we spent a few days on the USS Stennis during pilot qualifications -- including the catapult ride off the carrier! Favorite eye-opening film: "Cyberwar Threat" where I actually had access to Edward Snowden's archive of purloined NSA documents. I'd tell you

more but they'd have to shoot me! Of course "Hunting the Elements" is an all time favorite. I began making NOVA films as a filmmaker in 1999 and I've been a staff member at NOVA for almost 5 years (during which time I've overseen or been involved in close to 100 hours of programming) and EVERY one of them has something amazing or memorable. I am VERY lucky to have been on the inside of these stories (not to mention being able to meet amazing scientists around the world!)

POGUE sez: Far and away my favorite show was "Making Stuff: Colder"

(<https://www.youtube.com/watch?v=0evHKYwI90M>). Not my favorite SHOOT, mind you...they froze me, boiled me, encased me in ice, made me miserable for the purposes of explaining the properties of heat and cold!

But the show had an amazing structure: It started at body temperature and, over the course of the hour, notched down to absolute zero. A really mind-blowing show, with amazing effects and graphics. And a shivering host.

Medical science seems to jump the gun in determining what the public is exposed to . I think people would stay more engaged if we were not exposed to the churn that scientific research. Example, eat margarine not butter, wait butter is better. Eqqs are out; now they are in. Fat is bad, wait may be it is sugar. I think they mean well but after a while people tend to tune it out. My question is 'What can the media do to ignore the churn or at the very least be clear that these are theories that are still not thought out?'

[Crtum](#)

Pogue sez: Yeah, you could do a whole two-hour special just on THAT QUESTION.

Well, on one hand, you could say that the whole system is set up to favor "news" of "breakthroughs." You know--publish or perish. And, of course, there are occasionally political forces at play. (Why did the nation become obsessed with eliminating fat from the diet? Because 50 years ago, a Congressional report fingered SUGAR as the bad guy--and the sugar industry needed to turn the dietary finger of blame. [HuffPo Article](#))

MOST of the time, though, researchers are well-meaning and unbiased. They truly hope to find the TRUTH. And sometimes, that means that new, better-run studies replace older, smaller studies--with different results. MOST of the time, it's not jumping the gun--it's earnestly believing that the new findings replace the old.

What's a topic that Nova would like to do a show on, but ethically can't? Is there such a a thing?

[intensenerd](#)

CHRIS: Well, here's one way to answer your question, but it might not be what you were thinking of: We can't make a program that creates a conflict of interest due to funding. In other words, if we receive corporate underwriting, we must studiously avoid showcasing the products or services of the underwriter. We do not accept paid advertising and that includes quid pro quo. We adhere to journalistic standards at all times.

I suppose that if someone came to us and asked us make a film about a science experiment that we (or our community of science advisors) believe was unethical in its design (head transplant experiment anyone?) then we would not make the film. We aren't an investigative reporting strand so it's unlikely that we would even set out to make a film about the unethical nature of said experiment.

We do tackle subjects that are charged (evolution, climate change, nuclear power) and invariably in

those cases create friction with some -- but we always rely on serious scientists (and many of them) to help us navigate those topics to make sure that we are factual and fair.

I've watched NOVA since the 80's (even getting a printed show transcript once for a school paper on Maglev trains!) and really appreciate having a show of its quality available. Additionally, PBS's airing of Cosmos was largely responsible for nudging me towards chemistry instead of engineering. I feel that PBS's educational programming was a huge influence on me as a teenager.

I look at the vast amounts of very well-produced science documentaries produced by the BBC in the UK vs. the few available now on US TV and want to ask: What will it take to enable a long-term commitment improve the quantity and quality of science programming in the US when viewers seem to prefer docu-entertainment programming more and more? Is the licence fee-funded BBC model the only one that works?

[isochromanone](#)

Pogue sez: I'll let Chris, Mr. Producer Man, answer your actual question.

In the meantime, I just have to tell you how much this means to me: "PBS's airing of Cosmos was largely responsible for nudging me towards chemistry instead of engineering. I feel that PBS's educational programming was a huge influence on me as a teenager."

We all want to find meaning in life. We all want to do something useful in our work. And I have to tell you: Hearing about careers changed, lives changed, by our TV shows just blows me to smithereens. It just means the absolute freaking world to me.

I wrote up my experiences with our new Kickstarter NOVA campaign [here](#). But here's the tl;dr version: We never intended for these shows for children.

But something about our formula—hard science leavened by a little humor—winds up hooking kids as young as 5 years old. ([Here's one young man who's seen "Hunting the Elements" A HUNDRED AND TWENTY TIMES.](#)) I have an email folder full of notes from kids and parents, thanking us for these NOVA shows. I read through them whenever I'm depressed about the world.

CHRIS: That's a multi-part and complicated question. Here's one piece of info you may really find interesting -- many of our NOVA programs are produced in partnership with British producers and are broadcast (sometimes in slightly different forms and under different names) on the BBC, Channel 4 and other UK outlets. These partnerships help us to spread our funds more widely and produce more programs. So on NOVA you are seeing programs that reflect that sensibility. That said, let me tell you (I'm whispering now, please don't let anyone know) that there are a LOT of really weak and sensationalistic science programs in British TV! American viewers are largely shielded from those. We make sure to partner with the best of the best!

That said, it is true that the commercial broadcast world in the US has largely abandoned the field of high-quality, factual programming. NOVA doesn't have a lot of competition at the moment, which I don't believe is good for any of us. But who knows. Scripted TV is in the midst of a true renaissance of explosive creativity and an apparently ever-widening appetite for new content. Maybe the pendulum will swing away from low-brow reality programming back towards the kind of films we make. I hope so!

NOVA "The Case of ESP" from Jan 1984 seems a bit biased and supportive of pseudo-science. What happened to NOVA's integrity?

[zeroone](#)

CHRIS: Hmm, before my time. However, I can happily report that we have squashed every potential ESP film pitched to us since!