

1 NATIONAL RADIO ASTRONOMY OBSERVATORY

2 (GREEN BANK OBSERVATORY)

3 EIS PUBLIC SCOPING MEETING - NUMBER 2

4

5 HELD AT THE

6 GREEN BANK SCIENCE CENTER

7 155 Observatory Road

8 Arbovale, West Virginia 24915

9

10 Wednesday, November 9, 2016

11 6:30 p.m.

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PAGE

PROCEEDINGS 4

P R O C E E D I N G S

Whereupon,

MS. BLANCO: Dr. Ajhar.

DR. EDWARD AJHAR: Thank you. Thank you for coming to our Environmental Impact Statement Public Scoping Meeting, and I want to thank the entire staff of Green Bank Observatory and Karen O'Neil may have just stepped out, our director here. They've been very supportive of all logistics that we have to do.

I want to again thank you all for coming and just start out letting everybody know that a lot of times there's things that are published, things that are discussed, they're not always accurate so we want to try to get some of those points there, and fundamentally, it's very important that you understand that we have made no decision to close Green Bank Observatory. We are here as a part of a process looking at different things but there's been no decision at this point.

What we really need today are your comments and your input in the beginning of this process considering the different alternatives so that's our main purpose for being here today.

I'm going to start by introducing myself and the rest of the team members and then we're going to talk about some

1 background information and why we're here, what's the
2 background for -- that brought us here today and we will
3 talk about the preliminary proposed alternatives that
4 you've seen published and the resource areas to be studied
5 and that's what we're seeking input on. We will talk about
6 the Environmental Impact Statement process, and once our
7 brief presentation is over, we will open the floor to
8 public comments.

9 So my name is Edward Ajhar. I am an astronomer in the
10 Division of Astronomical Sciences at the National Science
11 Foundation, and I'm the program officer for Green Bank
12 Observatory.

13 Joining me today in our Division of Astronomical
14 Sciences is Liz Pentecost. She's back there. She will be
15 helping to direct the people making comments today.

16 From our Office of General Counsel we have Caroline
17 Blanco and Christin Hamilton.

18 In our Office of Legislative and Public Affairs, Karen
19 Pearce and Ivy Kupec.

20 We have some contractors that are helping us from CH 2
21 M Hill, Michelle Rouwe and Chris McDonough. I don't know
22 if they're in the room. Back here is one. Thank you.

23 So what is the role of the National Science
24 Foundation. We at NSF are the federal stewards of ground-

1 based astronomy and astrophysics. We provide funding for
2 national and international telescopes and facilities, and
3 we provide funding for research grants that allow
4 individuals and groups to conduct specific science
5 investigations.

6 As the stewards of the National Science Foundation's
7 Astronomy Portfolio we get a lot of input. Over the past
8 decade the NSF has received advice from external review
9 committees made up of the astronomical community and the
10 2010 decadal survey which is titled New Worlds, New
11 Horizons in Astronomy and Astrophysics stated the
12 following: "NSF Astronomy should complete its next senior
13 review so as to determine which, if any, facilities should
14 Astronomy cease to support in order to release funds for
15 one, the construction and ongoing operation of new
16 telescopes and instruments, and two, the science analysis
17 needed to capitalize on the results from existing and
18 future facilities."

19 So the 2010 reports recommended review that I just
20 mentioned of the NSF Astronomical Sciences Portfolio was
21 completed in 2012 and that portfolio review report is
22 titled Advancing Astronomy in the Coming Decade:
23 Opportunities and Challenges. So regarding the Green Bank
24 Telescope the 2012 review recommended divestment and stated

1 the following: "The GBT is the world's most sensitive
2 single-dish radio telescope at wavelengths shorter than 10
3 centimeters; however, its capabilities are not as critical
4 to the decadal survey science goals as the higher-ranked
5 facilities."

6 In August of this year, 2016, the National Academies
7 of Sciences, Engineering, and Medicine published their
8 mid-term assessment of the 2010 decadal survey and
9 reaffirmed the 2012 portfolio review's recommendation for
10 the divestment of these astronomy facilities. The quote is
11 "The NSF should proceed with divestment from ground-based
12 facilities that have a lower scientific impact implementing
13 the recommendations of the NSF Portfolio Review which is
14 essential to sustain the scientific vitality of the U.S.
15 ground-based astronomy program as new facilities come into
16 operation."

17 So as a result of that input we received from several
18 committees over the last few years I want to kind of go
19 over the resulting developments at Green Bank Observatory.
20 Starting in FY 2012, fiscal year 2012, the NSF provided 95
21 percent of this site's funding. On March 22nd, 2013, the
22 NSF published a Dear Colleague Letter, and there's the
23 number 13-074, and in that letter NSF announced that the
24 Green Bank Telescope would be separated from the National

1 Radio Astronomy Observatory competition and requested at
2 that time ideas for collaborations involving the Green Bank
3 Telescope, and we will say more about that in a moment.

4 On October 1st, 2016, just last month, following the
5 path published in that Dear Colleague Letter, 13-074, the
6 National Science Foundation separated NRAO Green Bank from
7 NRAO and the site was renamed the Green Bank Observatory,
8 and Associated Universities, Incorporated, AUI, continues
9 to manage Green Bank Observatory under a cooperative
10 agreement with the National Science Foundation.

11 I was here and many of you I'm sure were for the
12 inauguration ceremony last month and very nice ceremony
13 kicking off the new Green Bank Observatory.

14 So the current status then again to clarify what are
15 the budget levels and things, in the current fiscal year,
16 FY 2017, the President's Request Budget for other
17 astronomical facilities asked for \$11.5 million total for
18 Green Bank Observatory and Long Baseline Observatory and
19 the fiscal year 2017 President's Request Budget also shows
20 an increase to \$11.85 million in the following fiscal year
21 2018 for planning purposes.

22 Following a review of AUI's proposal that provides the
23 exact division between Green Bank Observatory and Long
24 Baseline Observatory for the current fiscal year 2017 and

1 following year fiscal year 2018, NSF allocated \$8.2 million
2 in fiscal year 2017 should the President's Request Budget
3 be appropriated, and as many of you know, we're operating
4 under continuing resolution. There is no fiscal year 2017
5 budget yet but that's so you know what the plan is.

6 This \$8.2 million level represents approximately 75
7 percent of the base budget for Green Bank Observatory that
8 was part of the previous appropriations to NRAO.

9 The collaborations that I talked about a few slides
10 ago, Green Bank Observatory has established collaborations
11 with Breakthrough Listen, West Virginia University, and
12 North American Nanohertz Observatory for Gravitational
13 Waves known as NANOGrav. Green Bank Observatory continues
14 seeking new funding sources so that's where we are today as
15 far as the budgets go.

16 Now what are NSF's plans moving forward? Well, given
17 the previous astronomical community recommendations that I
18 quickly summarized combined with current budget
19 constraints, NSF has a need to reduce funding for a number
20 of astronomical telescopes and facilities and because of
21 that the NSF is initiating the Environmental Impact
22 Statement, Section 106 consultation process for the Green
23 Bank Observatory as it already has with Arecibo Observatory
24 and the Sacramento Peak Observatory. So this is why we're

1 here today to start that process as part of beginning of
2 this process.

3 You've seen these Environmental Impact Statement
4 preliminary proposed alternatives that have been published
5 as part of the notification of these meetings and the
6 comment period. So we are interested in knowing comments
7 about these is this the right step of alternatives, are
8 there other suggestions so that's a part of the comments.

9 These proposed -- preliminary proposed alternatives
10 are the first is continued NSF investment for science-
11 focused operations. That's a no action alternative.
12 That's where we are today.

13 Number two is the collaboration with interested
14 parties for science- and education-focused operations with
15 reduced NSF funded scope.

16 The third, collaborations with interested parties for
17 operation as a technology and education park.

18 The fourth is mothballing of facilities, and by that
19 we mean a suspension of operations in a manner such that
20 operations could resume efficiently at some future date.

21 Finally, the last alternative being considered here is
22 deconstruction and site restoration.

23 So that's where we are with -- that's how we got to
24 the point we are today and that's why we're here to hear

1 your comments and a very important part of this process is
2 to hear directly written and oral comments from the public
3 on these alternatives so I'm going to turn over the rest of
4 the presentation to Christin Hamilton from our Office of
5 General Counsel. Christin.

6 CHRISTIN HAMILTON: Hello. Good evening. Thank you
7 for attending. We had a 3 p.m. meeting as well that was
8 very well attended. Your voices are important to the
9 environmental review process so we appreciate you taking
10 the time this evening to be here.

11 As Dr. Ajhar said, I am from the Office of General
12 Counsel, but I like to clarify that I'm actually not an
13 attorney. I'm an environmental compliance officer and I'm
14 here to walk you through the Environmental Impact Statement
15 process as I suspect a lot of you are unfamiliar with that
16 process.

17 It's dictated by the National Environmental Policy Act
18 or what we call NEPA which requires federal agencies to
19 consider the potential environmental consequences of
20 proposed actions on the environment prior to making final
21 decisions so we do this very early on in a decision-making
22 process.

23 There are three levels of investigation that occur
24 under NEPA and for this particular proposal because of the

1 nature of potential impacts we're taking the most in-depth
2 look which is the Environmental Impact Statement. We
3 intend to prepare one of these statements to evaluate the
4 potential environmental effects, proposed operational
5 changes due to funding constraints for the Green Bank
6 Observatory. We will do a draft and final EIS.

7 We announced the beginning of this process which is
8 very public on October 19th. That began the scoping
9 process for the development of this EIS.

10 So what is scoping? The purpose of scoping is to seek
11 public input regarding relevant issues that will influence
12 the scope of that environmental analysis. So what you say
13 here today and what you submit in written comments will
14 inform that Environmental Impact Statement -- will be
15 addressed in it.

16 We invite your input regarding all of the issues to be
17 evaluated including the identification of viable
18 alternatives and the resource areas which I will get to in
19 a minute.

20 The more specific your comment, the more helpful to
21 the development of the EIS. I also want to clarify that
22 this evaluation is to look at environmental impacts. The
23 that's what the focus is. It's not to provide an analysis
24 on the state of the science, for example.

1 So there's two sort of pieces of information that we
2 have developed at this early date and that is the list of
3 preliminarily identified proposed alternatives that
4 Dr. Ajhar presented and it is also in your fact sheet.
5 That's one piece of information that we do have at this
6 point, and the other is this list of preliminary resource
7 areas that we expect to evaluate in that Environmental
8 Impact Statement.

9 These are our diverse range of aspects of the
10 environment from air quality to biological and cultural
11 resources to socioeconomics, traffic, and groundwater
12 resources.

13 Concurrent to the NEPA process we will also be doing
14 consultation under what we call Section 106 of the National
15 Historic Preservation Act. This requires federal agencies
16 to consult with interested parties and the state historic
17 preservation officer regarding potential effects of their
18 proposed actions on nationally significant historic
19 properties.

20 So there are four basic steps outlined here to this
21 process: Initiation, identification of the historic
22 properties within the area of potential effects, an
23 assessment as to what are their adverse effects on the
24 historic properties, and then resolution which is often a

1 form of a memorandum of agreement.

2 This process will occur in coordination with a NEPA
3 process, and the way that works is the information that's
4 developed through this 106 process you will also see that
5 same information in the draft EIS, for example, and the
6 final EIS as well so they will track each other.

7 We invite consulting parties to participate in this
8 and we've asked you to sort of self-identify if you're
9 interested in participating as a consulting party on the
10 sign-in sheets so you had the opportunity to check if
11 you're interested and we will follow up with you via e-mail
12 to confirm your interest in participating in 106
13 consultation as a consulting party.

14 One more statutory obligation that I wanted to mention
15 today is the Endangered Species Act. We need to consider
16 whether the proposal's activities might affect a listed
17 threatened or endangered species or their habitat, and if
18 this potential exist, we would consult with the U.S. Fish
19 and Wildlife Service. Again, that same information that we
20 gain from the consultation will be seen in our draft and
21 final EIS.

22 I want to go through target dates and the
23 opportunities for comments. As I mentioned, October 19th
24 we began the public scoping process. There's a 30-day

1 comment period. We delayed a little bit due to an
2 issue with e-mail so we wanted to make sure we had the full
3 30 days when you can e-mail in comments. We're having
4 these two public meetings today.

5 We will take that input, we will be preparing a draft
6 Environmental Impact Statement. We're targeting spring to
7 release that. Everybody who is on our e-mail list and if
8 you signed in today you will be on our e-mail list will get
9 notification when that is released and it will be on our
10 website as well.

11 Following that release we will have a 45-day comment
12 period and, again, we will have two public meetings, a
13 daytime and an evening to try to accommodate people's
14 schedules. Those times again will inform the final
15 Environmental Impact Statement which we're targeting for
16 sometime around fall.

17 Concurrent to those processes we will be doing, as I
18 mentioned, a National Historic Preservation Act
19 consultation and potentially Endangered Species Act
20 consultation as well.

21 We're required by regulation to wait at least 30 days
22 following the release of the final EIS before making any
23 agency decision. The agency decision is recorded in what
24 we call the Record of Decision which we're targeting for

1 early 2018. That considers not only the environmental
2 considerations and any mitigation measures that are
3 identified in the final Environmental Impact Statement, but
4 also any other factor that is of importance to the National
5 Science Foundation and that could be science priorities or
6 budgetary constraints.

7 As for how to submit comments, you can provide verbal
8 comments today. We will have a full transcript of this
9 meeting attached to the draft Environmental Impact
10 Statement. You can submit written comments today. We have
11 written comment forms out at the tables where you signed
12 in. Give your comments to anybody with a name tag and we
13 will make sure that they get on the record.

14 You can also mail or e-mail your comments to NSF by
15 these two methods which are also on your fact sheet if you
16 want to refer to it later and it's also at our website
17 which I will get to in a moment.

18 So at any point along the way if you need information
19 on the process or if you need to review documents, please
20 see our website www.NSF.gov/AST, that's for Astronomical
21 Sciences Division.

22 The fact sheet, the copies of the informational boards
23 that are out there and this presentation itself will be
24 posted there, and as we move forward, for example,

1 documents relevant to that 106 consultation
2 will also be posted there.

3 So at this point we're ready to move into the public
4 comment period. We will be having my colleague Liz
5 Pentecost will be announcing according to how people signed
6 up.

7 Because of the number of people who are interested in
8 speaking today we really want to make sure that everybody
9 who wants to speak can speak. So much as we hate to set a
10 time limit we're going to try to keep comments to three
11 minutes each and if we have more time at the end and you
12 didn't get to complete your comments we will invite you to
13 come back up so I know when I'm speaking I never know how
14 much time has gone by so what I will do is I will time it.
15 I will be sitting right there and when I get to two minutes
16 I will stand up so that you know you have one minute more
17 to sort of wrap things up. Thank you for your
18 participation.

19 ELIZABETH PENTECOST: The first person Kathryn
20 Williamson.

21 DR. KATHRYN WILLIAMSON: Hi. I used to work here as
22 the public education specialist. My name is Kathryn
23 Williamson. I worked here until this past December and it
24 was a few years that I was here and it was transformative

1 for me. The Observatory helped me finish my dissertation.
2 I started working here before I got my degree. It was
3 inspiring.

4 I mean, I had all these degrees in physics, but I had
5 no practical skills so I came here and I learned about real
6 true STEM based education and I saw firsthand how
7 inspired students can be so I worked with the 40-foot
8 telescope and also the 20-meter telescope through Skynet
9 online.

10 I know you've heard a lot of comments from people that
11 have used the 40-foot educational telescope so I won't
12 repeat how that can be.

13 Now I teach at WVU in Morgantown and I use the
14 20-meter online with my students and you can do the same
15 types of experiments. We can detect hydrogen gas in the
16 Milky Way, map our solar systems rotation around the
17 Galactic Center, and even find information about the
18 presence of dark matter. All of this with like the
19 hundreds of students who take my class each semester,
20 college students from all kinds of backgrounds that are
21 non-science majors and they're getting this authentic
22 experience in large numbers.

23 In my letter that I wrote, you can see many of their
24 comments how transformative it was, how it made them feel

1 like real scientists, and how they realized it's actually
2 not that hard to do science. Many of my students have
3 wanted to continue in astronomy or science after taking my
4 class and using the 20-meter because there's no other way
5 to give them that kind of authentic radio astronomy
6 experience.

7 You know, a lot of astronomy labs around the country
8 use regular optical telescopes but you can only do basic
9 astronomy with those. You can't find evidence of dark
10 matter with those especially not in cities like Morgantown
11 where the light pollution is really bad so not only are my
12 students getting this like really different authentic
13 science experience, they're having this pride that is in
14 West Virginia and they collected their own data and it's
15 different. It's different than anything they've ever done
16 before and so I just -- I hope you consider the impact of
17 all the telescopes on site, not just the GBT, for its
18 educational and inspirational impact. So thank you.

19 ELIZABETH PENTECOST: Dave McLaughlin.

20 DAVE MCLAUGHLIN: I promise you I will be short. A
21 few comments I thought about today that came up. My name
22 is Dave McLaughlin, and I would like to thank National
23 Science Foundation for providing this time for public input
24 concerning the future of the GBO.

1 First things, as Pocahontas County Commissioner, you
2 would expect me to address the economic impact GBO has on
3 the local economy. Well, with 100 to 140 jobs, depending
4 on the GBO, I'm quite sure that is what is on top of most
5 folk's minds here today. That paycheck they earn is spread
6 throughout our county and communities. So every business
7 in the county is affected when that doesn't happen. Very
8 important for any small county like ours.

9 Secondly, I ask why if the NSF would continue to
10 pursue scientific research like what is done at the GBO,
11 why would they even consider defunding this site? Most
12 companies and businesses would do a cost-benefit ratio
13 process when they consider downsizing or realigning their
14 company. We know what the cost is of the GBO, but how is
15 it possible to put a dollar figure on the benefit side at
16 the GBO?

17 Discovering a new galaxy, a new planet, or even
18 extraterrestrial beings are priceless to a scientist and
19 that is what is happening here.

20 I don't know exactly how the NSF is funded, but I did
21 read in your pamphlet some of that so I understand a little
22 bit now. But I do know that millions of tax dollars are
23 invested at this site. I believe that NSF has to have a
24 very good argument if they plan on walking away from this

1 investment made by all taxpayers in the United States.

2 With the GBT being the largest fully steerable
3 satellite in the world is being used by several students,
4 scientists around the world. Shame on all of us if we let
5 it be taken out of service. It is one of the greatest
6 also -- it is one of the greatest resource -- research
7 tools ever built by man. Also, where else in the world or
8 U.S. can a radio free zone be established like the one at
9 Green Bank?

10 One final thought. The Green Bank Observatory the
11 last 50 years has become a great community partner. We
12 have help with our schools, emergency services, fire
13 service, and always willing to help with any community
14 activity when asked.

15 The GBO isn't some big secret site where the general
16 public isn't welcome. They always extend a hearty welcome
17 and a helping hand so please consider very carefully what
18 is at stake and what will be lost if defunding continues at
19 the GBO. Thank you again.

20 ELIZABETH PENTECOST: Dennis Egan.

21 DENNIS EGAN: Hi. I'm here to speak for the BFD Fire
22 and Rescue, the fire department that's served this area.
23 I'm also indirectly going to speak for the two just south
24 of here where we also get service.

1 The GBO is a significant supporter of the fire and
2 rescue in this end of the county. Oftentimes when we have
3 to have someone air evaced we use the airstrip down here as
4 an air evacuation landing zone and it's one of the better
5 ones we have because it is actually an airstrip.

6 The GBO site here is also our certified Red Cross
7 emergency evacuation area so it can be used for when we
8 have disaster in the county to bring people here. When we
9 had the storm in this area, a significant area here
10 was out of power and this was one of the few places where
11 people who were on oxygen could come and plug their oxygen
12 generators in and things like that so that's very
13 significant for this county. When we have floods, when we
14 have power outages especially in the wintertime we have
15 heat and electricity here.

16 Also, it's an emergency staging area. When we had a
17 helicopter go down from the Army National Guard, I guess
18 the National Guard, this is the area where everybody comes
19 to coordinate and there's facilities here to feed large
20 numbers of people and there's facilities here that they can
21 get warm and get rested so it's very important to this
22 area. It is a very rugged area. It's hard to get to
23 another place where you can do something like that.

24 The GBO also supports us with emergency equipment

1 repair sometimes if we have something that is -- that we
2 need fixed right away for the emergency services we can
3 bring it here and the facilities here can do that.

4 One of the biggest things that the Green Bank
5 Observatory provides is water. We have nowhere right
6 nearby here where we can get water in any kind of a fire so
7 we would have to draft out of the stream. The Green Bank
8 Observatory here provides us with water which is one of the
9 major things that helps us with our ISO rating which is an
10 insurance rating so you talk about -- you talk about
11 economic impact, the insurance -- fire insurance for this
12 area would go up 15 to 20 percent within about six miles of
13 here which is most of the Green Bank area. Would be about
14 15 to 20 percent if we didn't have the water here with GBO
15 so that's a significant impact.

16 We also have indirect benefits here. The people here
17 who work for the Green Bank Observatory are people who have
18 technical abilities that help us a lot. Radio and any kind
19 of -- a lot of mechanical things they can help out with
20 maintenance and with getting things set up so it's very
21 important that if those people were to go away -- if the
22 technical people were to go away that are here only for the
23 science if they were to leave we would have a very
24 difficult time from about halfway to Durbin down to about

1 Dunmore serving this area at all.

2 CHRISTIN HAMILTON: I'm going to have to stop you
3 there, sir. If there's more time afterwards you can come
4 back.

5 ELIZABETH PENTECOST: Alex Bryant. The next person
6 after Mr. Bryant is Ruth Blond or is it Bland?

7 RUTH BLAND: Bland.

8 ELIZABETH PENTECOST: Sorry.

9 RUTH BLAND: That's okay.

10 ELIZABETH PENTECOST: Mr. Bryant. Is Mr. Bryant
11 here? I guess not.

12 RUTH BLAND: Good evening, and thank you very much for
13 affording me the opportunity to speak concerning the GBO.
14 I am Ruth Bland, and I am the Director of Student Support
15 Services Transportation and Technology for the Pocahontas
16 County Board of Education.

17 The Pocahontas County Board of Education supports
18 total funding from the NSF for the Green Bank Observatory.
19 I have been an employee here in Pocahontas County schools
20 for 34 years and spent ten years as a principal at Green
21 Bank Elementary-Middle School.

22 The National Radio Astronomy Observatory at the time
23 provided many services for Green Bank school and when the
24 Internet first came to Pocahontas County, the technicians

1 here at the Observatory wired that school. We now have
2 over ten miles of hardwiring in that school that the
3 Observatory has helped us purchase, to maintain, and to
4 continue to grow the network. Even though it isn't
5 wireless it is growing throughout the building. We just
6 had a major upgrade over \$41,000 from our E-Rate and the
7 help that we received from the Green Bank Observatory to do
8 that is instrumental in being able to keep that system
9 functioning.

10 The other thing is as a principal we live in a
11 laboratory here, not only with the stars, but with the
12 environment in general, and the wetlands, and the
13 opportunity to have a Golden Eagle station on
14 this property for our students to observe the Golden Eagle
15 in their natural habitat was just absolutely phenomenal.

16 I'm going to put aside my profession and I'm going to
17 talk to you as a mother. My youngest daughter is now a new
18 first-year teacher teaching biology and earth science at
19 Pocahontas County High School. She has a biology degree,
20 not earth science, but this summer in a cooperative program
21 with Fairmont State University she was able to take two
22 weeks of classes here to prepare her to be a better teacher
23 for those kids at Pocahontas County High School so those
24 type of programs are instrumental for us as a community and

1 as families. My daughter has come back to live in
2 Pocahontas County because of this opportunity. Thank you
3 very much.

4 ELIZABETH PENTECOST: Next is Joe Gonzalez and then
5 Alan Balogh.

6 JOE GONZALEZ: Thank you. I don't think I've ever
7 been restricted to three minutes but I'm going give it a
8 try.

9 First of all, I would like to thank all of you for
10 coming and giving us all an opportunity to participate.

11 The Green Bank Observatory is the community in
12 Northern Pocahontas County, every aspect of it, all the
13 employees, all the support that's given.

14 I'm the president of the Central Appalachian Astronomy
15 Club that we co-sponsor the Green Bank Star Quest as you've
16 heard earlier testimony. I'm the former communications
17 director for the state emergency medical service so we've
18 had for many, many years the opportunity to work with the
19 Observatory in maintaining a healthy radio quiet zone so
20 everybody can work together because our interest was in
21 public safety and without communications people can die.
22 It's just that simple.

23 The important thing is option four and five are not
24 even to be considered. It's ludicrous to think that you've

1 got nearly a one billion dollar facility of taxpayers'
2 money that's invested in this area to even think of ever
3 closing it.

4 The amount of science that has been created here, the
5 new technologies that's been created here is an ongoing
6 thing. You can put the GBO up against any other facility
7 in this country and they are number one in their
8 accomplishments.

9 The science alone, the things that we do with the
10 Green Bank Star Quest we've been very fortunate to have
11 Alan Bean, fourth man to walk on the moon; the Rocket Boys;
12 Carolyn Shoemaker; Seth Shostak, all those folks come here
13 and it's the only facility that's available that you can
14 collaborate with the general public, anybody, and to be
15 able to learn science.

16 We've got a new administration and maybe I ought to
17 knock on some doors and see how we can restructure to
18 refund science because in the past decade we have not had
19 science in the United States. We wish you well. Let us
20 know what we can do for you to help keep the facility
21 open. Thank you.

22 ALAN BALOGH: Thank you. My name is Alan Balogh. I'm
23 the Mountain Party's candidate for the 43rd District House
24 of Delegates this year.

1 I would urge the National Science Foundation to
2 continue funding the facility here for a number of
3 reasons. One, the Observatory it's a historic site at this
4 point. I mean, it does pretty much define Green Bank. It
5 does important work here, and like it's been said before,
6 there aren't many places in the Eastern United States that
7 are quiet zones like this. I mean, I've driven a truck,
8 retired earlier this year, been to 48 states and six
9 Provinces of Canada, and I'm keenly aware of what a rare
10 area this is for this type of thing.

11 It's also a tourist attraction. When we moved here,
12 my family and I 27 years ago, this was one of the
13 attractions. It's just really cool having this here in
14 this county. Many of my friends and relatives that have
15 visited this is where they wanted to come and visit.

16 Also, the facility is used by local groups. My wife
17 is real prominent in the Pocahontas Nature Club and they've
18 used the facilities here to hold meetings. It's in this
19 end of the county, it's a great place to do that.

20 The other thing is Pocahontas County, it's, you know,
21 a lot of farming and timbering, and if you're a kid it
22 isn't oriented toward that type of thing. The facility
23 here, the scientists and the technicians and their
24 families, it's a great opportunity for other students to

1 spark an interest in different careers that they wouldn't
2 normally have.

3 This is a general comment. I know you're not really
4 looking for that but I think we need to think about it.
5 What we're really talking about is economic man versus
6 culture man. Science, art, music, literature, these are
7 the things that separate us from animals. I mean, animals
8 have economies; ants, beavers, but what makes us special is
9 places -- science and art and so forth, and if you put
10 everything on just a profitability basis, it's not going to
11 work. Some things are worth sacrificing for.

12 I think the money is out there. We spend like a
13 budget probably every day and somewhere overseas
14 and the next day they rebuild it so the money is there.
15 But if our governor-elect would pay his taxes it would
16 probably be funded for a third of the year or so, but what
17 we really need to do in the long run is to elect people to
18 office who put people in culture ahead of just profits;
19 otherwise, we're going to sacrifice everything like this.
20 Thank you.

21 ELIZABETH PENTECOST: Loren Anderson, and I know I'm
22 going to mispronounce your name. Kaustubh Rajwade.

23 KAUSTUBH RAJWADE: Rajwade.

24 ELIZABETH PENTECOST: Rajwade. Okay. Sorry.

1 DR. LOREN ANDERSON: All right. My name is Loren
2 Anderson. I'm a faculty member at West Virginia
3 University. Fifteen years ago WVU only had one
4 astronomer. Today we have seven including Kathryn who
5 spoke earlier.

6 The Department at that time 15 years ago had zero
7 graduate students. We currently have over 20, many of whom
8 are in the audience today. We have accounted eight post-
9 docs and hundreds of undergraduates at WVU,
10 many of whom are from the local area, so as our Department
11 has grown, our scope has grown and we're able to educate a
12 much larger number of students now today.

13 All of this growth is due to our connection with the
14 GBT so we bring many students down here for training. All
15 of us faculty members come down here and stay for a couple
16 of weeks each year and this is where we train our
17 students. This gives our students hands-on experience
18 doing science that is not available for most departments in
19 the country.

20 If the NSF decides to remove funding for the telescope
21 entirely or even decrease funding to a level where it is
22 difficult for us scientists to get telescope time, all of
23 those gains would go away.

24 Our connection with the telescope is so strong that it

1 has brought all of us faculty members here to West
2 Virginia, and if the connection were reversed all of us
3 faculty members, I'm convinced, would leave and that would
4 have serious detrimental effects on our ability to educate
5 West Virginia students. Thanks.

6 KAUSTUBH RAJWADE: Good evening, everyone. My name is
7 Kaustubh Rajwade. So I'm a graduate student in the Department
8 of Astronomy at West Virginia University and I come from India
9 so when I started applying for graduate schools WVU was one
10 of my top choices and the reason was that I always wanted
11 to do radio astronomy when I was looking for grad schools.
12 The only reason I came here was for so that I could use
13 the Green Bank Telescope. It has been the only reason
14 that I was able to do research in the last three years at
15 grad school.

16 When I say this, I believe I say this for all the
17 other international graduate students that are there in the
18 Department that this has been one of the major factors that
19 has attracted so many international students to WVU
20 especially the Department of Astronomy. If this facility
21 is closed it is going to have a severe impact on the
22 international reputation of not only the Department but
23 also at the university in general. So I hope the NSF takes
24 that it into account when they take a decision on GBO.

1 Thank you.

2 ELIZABETH PENTECOST: Nick Pingel and Pete is it
3 Gentile?

4 PETE GENTILE: Gentile.

5 ELIZABETH PENTECOST: Gentile. Close.

6 NICK PINGEL: Thank you. My name is Nick Pingel and
7 I'm also a graduate student at WVU. I come from one of the
8 smaller kind of research groups where it's just myself, my
9 advisor, and two other grad students.

10 Since when I started here in 2013 we collectively have
11 observed on the GBO 600 hours and that 600 hours is
12 translated to \$1.5 million in grant money using that
13 research so I only say this to point out that you are
14 getting a return in your investment when you fund the
15 science for this telescope, and I hope you consider that
16 when -- if you would close it, the economic effects that it
17 would have on the state level and, of course, the local
18 level as well so thank you.

19 PETE GENTILE: Hi. We are so lucky to be here, right
20 here in West Virginia. Over the past couple of years I've
21 had the opportunity to say those exact words in middle
22 school and high school classrooms to prospective and
23 current West Virginia University students and to amateur
24 astronomers at their club meetings across the state and

1 then I get to tell them why. Because their state, their
2 home is home to the largest fully steerable telescope that
3 man has ever built.

4 Space is inspiring. It touches us. Apollo 11, the
5 Hubbell Deep Field Image, the Pale Blue Dot, they all have
6 this uncanny way of exercising that universal feeling of
7 awe in connection to nature. The Green Bank Telescope
8 makes that connection with astronomy a two-way connection.

9 Perhaps more than any other telescope it lets students
10 touch space. In programs like the one I work with, the
11 Pulsar Search Collaboratory, kids can come to Green Bank,
12 literally touch the telescope, go to the control room, sit
13 behind the computer, and with a guide in hand students can
14 control the Green Bank Telescope. It shows these students
15 that science and astronomy isn't reserved for some academic
16 inner circle but if you like this crazy cool sciencey stuff
17 then it's for you.

18 This isn't some ideal version of what we as people who
19 are trying to connect students with science hope will
20 happen here. This is what has happened here. This is what
21 is happening here.

22 We keep in touch with these students and astounding
23 numbers of them tell us how their experiences at Green Bank
24 have changed the path through high school and college,

1 through life, and they want to share these experiences that
2 have inspired them here at Green Bank with their fellow
3 students back home so in the age of Pokemon GO, I kid you
4 not, these kids go back home and start pulsar clubs. How
5 nerdy and awesome is that.

6 It's all because the Green Bank Observatory does what
7 a thousand Petes or a thousand Kathryns could never do. It
8 lets students make their own connection with science and
9 lets them know that they can go as far as their curiosity
10 will take them, and so I urge you to consider funding the
11 Green Bank Observatory because it's simply too unique and
12 too important not to. Thank you.

13 ELIZABETH PENTECOST: Ryan Lynch and then Will
14 Armentrout.

15 DR. RYAN LYNCH: Hello again. The last time I talked
16 as the summer student program coordinator. I'm going to
17 put my science hat on today and talk as a member of the
18 NANOGrav collaboration and just as a user of the GBT from
19 the pulsar astronomy community.

20 I know you said in the beginning the scientific merits
21 are not in consideration here, but I really think the
22 impact on the scientific community at large needs to be a
23 part of the Environmental Impact Statement because science
24 is the primary reason that this telescope exists in the

1 first place. So in that vein I just want to mention a few
2 keep points.

3 The first is that you mentioned earlier that the
4 community has recommended that lower impact facilities
5 might be divested from, but the GBT is not a low-impact
6 facility. Frankly, the portfolio review that recommended
7 closure is outdated. It's been eclipsed by the science
8 that has occurred in the last four years.

9 We in NANOGrav are on the verge of discovering low
10 frequency gravitational waves from black holes throughout
11 the universe. Gravitation wave astronomy has been
12 highlighted by the NSF, the whole NSF, not just the
13 astronomy division as one of five big idea areas that NSF
14 would like to invest in in the future. It's also been
15 highlighted by the decadal survey reviews as a key science
16 frontier discovery area for astronomy in particular.

17 The other thing I want to mention is that reading the
18 Arecibo draft report I was struck by how limited the scope
19 was in terms of the bigger picture, the bigger context.
20 The NSF is really talking about shutting down potentially
21 or severely reducing the amount of time available for
22 science on its two large single-dish radio telescopes. You
23 can't really look at one without looking at the impact of
24 the other because if we lose both of those then we

1 effectively see U.S. leadership in low frequently radio
2 astronomy just at a time when we are on the verge of making
3 some of the biggest discoveries in the field really in
4 history.

5 There is a lot of talk about using other facilities
6 like the VLA as a fill-in for that. The Very Large Array
7 is a fantastic facility but it cannot make up for the GBT
8 or Arecibo.

9 There's been a lot of talk about international
10 facilities that are coming online in the future such as
11 FAST in China and MeerKAT in South Africa, but these
12 facilities are not yet completed. We don't yet know
13 whether or not they're actually going to work as
14 advertised, and we don't yet know what U.S. astronomers
15 will have in terms of access and time on these facilities
16 so we could be losing our leadership at a time when
17 the rest of the world is investing. That is going to cause
18 astronomers to leave the U.S. and take their expertise
19 elsewhere and basically leave us without that core
20 community.

21 That has a huge socioeconomic and cultural impact as
22 well because these people give back to the communities that
23 they're in as we've heard time and time again here today
24 and they contribute to the types of things that Pete just

1 talked about in terms of building a culture that
2 appreciates science and takes pride in what it does.

3 The only other thing I want to say is that we've heard
4 a lot, rightly so, about how options four and five really
5 are just unacceptable and I reiterate that, but really any
6 cut in the amount of open-skies science time that is
7 available for the wider astronomical community is going to
8 severely impact the large community at Green Bank.

9 The facility -- the people who are here if we cannot
10 continue to do high-impact science some of them are going
11 to consider going elsewhere. There are other impacts that
12 will propagate throughout the community even if it is -- we
13 do stay open under options one through three, and that's
14 why I would strongly urge you to recommend option one.
15 Thank you.

16 WILL ARMENTROUT: Hello. My name is Will Armentrout
17 and I'm a doctoral student at West Virginia University. I
18 will reiterate a bit of what you've heard from other Ph.D.
19 students at the university, but kind of lay it out in a
20 three-tier process.

21 I would like to talk about the educational impact on
22 students, the public, and professionals from around the
23 West Virginia area and from the international community.

24 If you can imagine this pure middle structure where at

1 the bottom we have public outreach, the middle we have
2 students, and at the top we have professional astronomers
3 coming here to work and to interface at meetings.

4 Now the Pulsar Search Collaboratory as Pete mentioned
5 is a way to engage very heavily students for weeks at a
6 time in the summer in learning pulsar astronomy,
7 understanding the basics of science, but the outreach at
8 the Observatory, the public museum, and outreach efforts
9 that the Observatory does is important in engaging tens of
10 thousands of people throughout the community to draw them
11 here maybe to spark their interest in science or in
12 technology for years to come in the future. That's a very
13 important stage or step we have in West Virginia to really
14 engage the next generation of scientists.

15 I will move from the base structure then to kind of
16 this middle section, and the middle section, like I said,
17 is engagement with students at the university. This is a
18 huge draw for graduate students attending West Virginia
19 University. If you are a graduate student in the audience
20 from West Virginia University could you raise your hand?
21 You can see we have dozens here. We have dozens back at
22 home who couldn't make it. They get the chance to
23 interface with the telescope from day one becoming
24 technical astronomers that use not only the Green Bank

1 Observatory but observatories from all around the world and
2 they're really honing those skills here.

3 The last stop that I would like to talk about is the
4 importance of the Green Bank Observatory and the
5 professional community. So every few years the Green Bank
6 Observatory has a single-dish observing school that brings
7 astronomers here, students, and professionals from all
8 around the world to really hone their skills as a technical
9 astronomer and they have other meetings throughout the year
10 that highlight many different high-impact areas of science,
11 but it is a way to connect professional astronomers and
12 student astronomers and the public at all three of these
13 very important levels to give you the full path of science
14 in America and science in West Virginia. Thank you very
15 much, and I urge you to consider options one through
16 three.

17 ELIZABETH PENTECOST: Robert Wilson and Paul Baker.

18 ROBERT WILSON: Hi. I'm Robert Wilson. I would like
19 to thank you for allowing me to speak here on behalf of the
20 GBM, GBT. I'm an undergraduate at West Virginia
21 University. I'm an aerospace engineering major, not
22 physics or astronomy, but I have been involved in things in
23 the past where -- that have brought me to the Green Bank
24 Observatory. It has had a profound impact on my life.

1 I remember being six or seven years old and coming
2 here with my dad when it just opened up. I will talk about
3 when I first started at WVU back in 2014 I joined something
4 that Kathryn Williamson who is in the audience started
5 which is the Space Public Outreach team for West Virginia.

6 What the Space Public Outreach team does is it fosters
7 the spreading of the word of science kind of to the K
8 through 12 students and I guess students in the state of
9 West Virginia.

10 What we do in the Space Public Outreach team is we go
11 to students in West Virginia and we try to communicate
12 science to them in a way that's understandable to them.

13 When you try to talk to students about science
14 sometimes things can get abstract. When you want to talk
15 about pulsars these are things that are out in space that
16 these students will never see in their lives. It's very
17 easy to just make these things kind of seem very detached
18 from what these students usually go through in their
19 day-to-day lives.

20 When you have something like the Green Bank
21 Observatory and something that they can physically link
22 these students to the kind of things that are out there,
23 it's a great tool for me when I'm trying to explain to
24 these kids what these things are. It's a really great tool

1 and it's something that is really profound that we have
2 here in West Virginia.

3 The low income areas in the state it's very difficult
4 for some of those students to actually you know just
5 understand -- not understand, but be informed of kind of
6 some of the science that's going on. Essentially --
7 sorry. I'm blanking here. It's kind of embarrassing. No,
8 no, it's fine.

9 It's really important that these kids kind of grow up
10 and are able to, you know, interject themselves into a
11 society and have the ability to become professionals and
12 having the GBT here is a great way to do that. It's very
13 important that these students know this state has a future
14 in science and technology and it's not just coal and
15 natural gas. You can't put a dollar sign on the things
16 that the Green Bank Observatory is doing for the students
17 in the State of West Virginia.

18 DR. PAUL BAKER: Hello. I'm Paul Baker. I'm a
19 postdoctoral fellow in the Center for Gravitational Waves
20 and Cosmology at West Virginia University. I'm also a
21 member of the NANOGrav Collaboration.

22 NANOGrav uses the Green Bank Telescope for most of its
23 observing, and seeing the facility close down would be a
24 huge detriment to that effort so NANOGrav is looking to

1 detect low-frequency gravitational waves and we saw with
2 the recent LIGO detection of gravitational waves it brought
3 up a great deal of public enthusiasm in science and physics
4 and astrophysics. I see using the Green Bank Telescope for
5 NANOGrav to continue on in that as a way to reach out to
6 not just students but the general public in thinking about
7 these fundamental questions of science.

8 Also, my decision to come to West Virginia to work at
9 West Virginia University hinges on the university's
10 involvement in NANOGrav and this particular project and the
11 Green Bank Telescope, so I think without the Green Bank
12 Telescope, West Virginia University and the State of West
13 Virginia would be missing out on people coming to this
14 state to work on science. Thanks.

15 ELIZABETH PENTECOST: Navid Motlaghi. Did I pronounce
16 it right? I hope. And Michael Lamb.

17 DR. MICHAEL LAMB: Hi. So I'm Michael Lamb. I'm a
18 postdoctoral fellow at West Virginia University and I'm
19 also a member of the NANOGrav Physics Frontier Center. I
20 am the NANOGrav PFC post-doc for West Virginia University.

21 I just wanted to talk about the impact on students
22 from the broader national community. In 2009 I was a
23 member of the NRAO Research Experience for undergraduates
24 in Charlottesville, not at Green Bank, but we came over to

1 Green Bank to do a lot of training and we met with students
2 here at Green Bank and we used data at Green Bank. We took
3 observations from Charlottesville, and I want to say like
4 what a huge impact this has been for me.

5 I went to a small teaching college where there was
6 only one astronomer at the time so the astronomy research
7 opportunities were very limited. I ended up working in the
8 pulsar astronomy community. That informed my decision of
9 what I wanted to do for graduate school was to continue
10 working in pulsar astronomy so I attended Cornell
11 University. I finished my dissertation this past year and
12 now I'm at West Virginia continuing to do what I think is
13 really, really amazing forefront science.

14 Without the Green Bank Telescope I would echo what a
15 number of people have said, I don't think that West
16 Virginia University and I don't think the State of West
17 Virginia would really have a huge impact on science. I
18 think that the amount of people that it brings in both
19 internationally, which has also been mentioned, locally,
20 and nationally, people are coming from all over the place
21 to use the facility to do really, really good science and
22 to really make a difference. Thank you.

23 ELIZABETH PENTECOST: Paul Brook and Laurel Dilley.

24 DR. PAUL BROOK: Hi, guys. My name is Paul Brook, and

1 I'm a postdoctoral researcher at West Virginia University
2 also. I just wanted to add my voice to those who have
3 talked about coming from elsewhere in the world to come and
4 study or work here in West Virginia.

5 I finished my Ph.D. last year at the University of
6 Oxford in England and when I was looking for the next step
7 in my career the reason I wanted to come to West Virginia
8 University is because as we've heard, there's a great bunch
9 of people in the physics department. It is a growing
10 department and they work on really important and
11 interesting science in areas of particular interest to
12 myself. Also, I've had -- the main reason for all those
13 positives is not in small measure due to the Green Bank
14 Telescope.

15 There's not many English people in Morgantown, West
16 Virginia. When I'm walking around doing my shopping and
17 speaking to members of the general public and they hear my
18 accent which they initially think is Australian and then
19 eventually they can see that I'm English, it doesn't take
20 very long for the question what the heck are you doing in
21 West Virginia. We have a little conversation about that,
22 but the bottom line is always I'm here because Green Bank
23 Observatory is here.

24 So if you want to continue to attract people from all

1 over the world, which I hope you do, then we have to
2 recognize that this is in big part due to the telescope
3 here and the Observatory. Thanks.

4 ELIZABETH PENTECOST: Lesley Goodall and Adam
5 Kobelski.

6 UNIDENTIFIED: I think you've got Laurel Dilley still.

7 ELIZABETH PENTECOST: Oh, I'm sorry.

8 LAUREL DILLEY: Hello. I'm Laurel Dilley. I have two
9 things I wanted to address tonight. The first is just as a
10 lifelong resident of West Virginia and huge advocate for
11 the state. I grew up in neighboring Pendleton County and
12 the Observatory was always such a cool thing to have right
13 next door. We would be so excited when we could go on
14 field trips over here to Green Bank.

15 I attended West Virginia University and majored in
16 math and helped out with the governor's school for math and
17 science for several years and I know it was stationed here
18 occasionally. There's just so many cool academic
19 opportunities for kids in this state.

20 I also think West Virginia suffers from the rural
21 brain drain and this is something that can actually reverse
22 that and get students who want -- are interested in West
23 Virginia and want to come back it gives them something in
24 technology or engineering or science field that they can

1 actually look forward to and come home.

2 The second thing I wanted to address is I teach math
3 and computer science at the high school. Computer science
4 was just started about two years ago with the help of a
5 math coach in our county and nobody had any background in
6 computer science. I was one of the math teachers so I
7 volunteered to do it, but I absolutely would not have been
8 brave enough to do that or would not have been possible if
9 it wasn't for the Observatory.

10 Ray Creager specifically stepped up and he comes to
11 our classroom one day every single week and volunteers his
12 time to teach the kids to code PYTHON.

13 The NRAO also -- or the GBO hosts the Hour of Code
14 field trip for all the ninth graders every single year so
15 that they can come and see just what coding is all about
16 and learn binary and get to see the machine shop. It's a
17 really, really cool experience for these high school
18 students.

19 We only had a graduating class of about 62 last year.
20 Ten of those 62 seniors were in the first computer science
21 class, and five of them are now majoring in computer
22 science in college. This year we have 17 students in that
23 class and almost all of them say they either want to major
24 or minor in computer science, so once again, that wouldn't

1 be possible if not for the collaboration of Green Bank with
2 our schools.

3 They've also hosted math field day regionally and so
4 many other things. Anything we ask them to do at the high
5 school they are very cooperative and it is a huge
6 inspiration to me as a teacher to know that I have that
7 support. Thank you.

8 LESLEY GOODALL: I'm Lesley Goodall. I guess what I'm
9 going to say is kind of putsy compared to everybody else.
10 I'm an occupational therapist. I work in the schools. I
11 work in the home health and intervention and the
12 hospital. I know pretty much everybody in the county or at
13 least their child or their grandchild.

14 Almost every aspect of my life has been touched by the
15 GBO. We need the population to keep our schools and our
16 hospitals going.

17 Most of what the GBO meant in my life is through my
18 son who is now 20, but he attended the Green Bank school
19 and there was Star Lab, which I was asking somebody, do you
20 all know what that is, the cool thing that the kids get to
21 see? Okay. Yeah. That's such a cool thing and it goes
22 to -- we have five schools in this county. It goes to all
23 the schools and they teach the kids about the universe and
24 all these great things.

1 Most of the judges for our social studies fair,
2 science fair, if I'm not mistaken, come up from up here.
3 What I'm trying to say is the employees of GBO contribute a
4 lot to our schools and to our communities.

5 My son was able to become an Eagle Scout because some
6 of the staff up here and their kids all -- we did Boy
7 Scouts up here. We did the overnights. My son and I both
8 became EMTs due to Janet Ghigo because she teaches it up
9 here. She teaches it every year, and her husband works
10 here if I'm not mistaken.

11 My son got his first paying job painting the satellite
12 dish and is now certified to climb way up in the air which
13 is great because he wants to work in the rain forest.

14 Also, he's at Virginia Tech. No boos, please. But I
15 am from Virginia. He considers himself from West Virginia,
16 but he's constantly defending West Virginia, and the one
17 thing that he can talk about is yes, the satellite dish.
18 Wow, you got near that. Wow, that's like brain stuff.
19 It's really good for our state. He was actually on the
20 plane to Spain with Ms. Minter whose husband also works
21 here, and he was saying that to some Russian -- some
22 foreign group and he got off the plane and he goes man, he
23 said those guys asked me where I was from. He said you
24 don't know. They were like where. He said West Virginia.

1 Oh really. He said, yeah, this little place called Green
2 Bank. Oh yeah, it's the telescope. You know, they knew
3 it. But GBO is really a part of our community.

4 I'm also in the book group that's run by -- where is
5 she? Out there. Yeah. That's run by people that are
6 staffed here.

7 I think our churches would shut if we didn't have the
8 GBO. It means a lot to the community. The walking trails
9 and the riding trails it's where everybody gets our
10 exercise. Please fund it.

11 DR. ADAM KOBELSKI: Hi. Thanks for being here. I
12 know this has got to be a long day for you all so I
13 appreciate you taking the time for this. I'm Adam
14 Kobelski. I used to be a post-doc here and I came all the
15 way from Alabama to attend this and be here today so if
16 there's nothing I say here that is relevant, hopefully that
17 carries some weight to it.

18 One of the things that I think is really important
19 about places like this which there are very few of these
20 places left of real science camps, places where you can
21 come and be cut away and do your science. We all do our
22 work now at our desktops in our offices and we never
23 actually get away and actually connect to the data to what
24 we're trying to do and get our heads out of doing laundry

1 and connecting all these other chores. This is one of the
2 last facilities left to do that.

3 On that same note, this is also one of the last
4 facilities where as a scientist you get to see and meet and
5 talk to and know everybody that's involved in doing the
6 science.

7 I know most of the people in this room. Where I work
8 now I know very few people in the building. But you know
9 everyone in the town, everyone who makes the telescope
10 work, and it's an amazing team that is unrivaled anywhere
11 else at least as these types of facilities and it's not a
12 commonplace thing and it's really gone just because of the
13 state of how we have to do science now and it's real
14 important to at least keep a few of these going.

15 One of the last things I wanted to talk about is how
16 facilities like this provide the opportunity to train
17 cross-disciplinary science which is something that often
18 is lacking.

19 I'm a solar physicist. I moved here with very little
20 radio astronomy knowledge and I am now somewhat qualified
21 to do radio astronomy. I now am able to use these skills
22 to use other NSF facilities to study the science there at
23 the sun which is the huge benefit to all the other
24 opportunities and things available for NSF so it's really

1 great to keep places like this alive to train other people
2 like me to be able to use all the facilities that NSF has
3 to offer. Thank you.

4 ELIZABETH PENTECOST: John Leyzarek.

5 UNIDENTIFIED: I believe he's out in the other room.

6 UNIDENTIFIED: He will hear you. You can do the next
7 person.

8 ELIZABETH PENTECOST: He's the last person.

9 UNIDENTIFIED: If someone didn't sign up can they
10 speak?

11 ELIZABETH PENTECOST: Did you sign --

12 UNIDENTIFIED: I guess also if there's anybody from
13 the last session who didn't have an opportunity to finish
14 their comments if they would like to, I would like to offer
15 them that opportunity as well.

16 ELIZABETH PENTECOST: Did you sign in to begin with?

17 UNIDENTIFIED: Yes, but I didn't know how many people
18 would be speaking so --

19 ELIZABETH PENTECOST: That's fine. You can speak
20 after Mr. Leyzarek.

21 CHRISTIN HAMILTON: Liz, you had another hand back
22 there as well.

23 JOHN LEYZAREK: My name is John Leyzarek. Thank you.
24 I'm sorry for the delay. I was going to put this in

1 writing. I appreciate the opportunity to be here. This is
2 a place I only want to say should be preserved and it
3 has -- it's a unique phenomenon in not only Pocahontas
4 County and West Virginia, but in the country and in the
5 world. It makes an enormous contribution to the cultural
6 environment as well as the scientific world here in
7 Pocahontas County.

8 Among the alternatives that I've seen discussed are
9 the deconstruction and restoration, and that's kind of in
10 addition to being a dreadful thought it's almost laughable
11 because as far as I can tell this place is already managed
12 with a high degree environmental responsibility and it
13 apparently maintains an enormous deer herd.

14 I don't want to waste anybody's time. This is a long
15 night, but I want to support very strongly the second
16 alternative that I've seen proposed which is to maintain
17 National Science Foundation involvement and also make the
18 facilities available to and solicit funding from the widest
19 possible range of potential users.

20 I understand to some extent this is already being
21 done, but I think without being a marketer, without having
22 studied the market for all the different facilities that
23 there are here, I'm sure many more players can be involved
24 and have been so far, and anything I as an individual can

1 do to promote that, I'm sure there are a lot of other
2 people who would like to do that also.

3 I think collaboration, privatization is a wonderful
4 thing, the coming thing. We can only look at the
5 transition of physical space exploration out of the
6 exclusive hands of government into partnerships between
7 government and private entities so I strongly support,
8 hopefully the Observatory will stay here and thrive and
9 make its contribution even more widely. Thank you.

10 UNIDENTIFIED: Liz, if we can just hold on one
11 second. We can go one, two. People who haven't spoken
12 yet. Three, four, five.

13 ELIZABETH PENTECOST: I think this lady right here
14 first, please. Go ahead.

15 CHRISTINA CUNNINGHAM: Well, my name is Christina
16 Cunningham, and I wasn't going to speak at first because
17 there's actually so much to talk about. I will be writing
18 a letter and I will be addressing most of the concerns.

19 I have a unique background in that I wouldn't have
20 been here at Pocahontas County if it wouldn't have been for
21 the Observatory. My dad decided to move us here and give
22 us an opportunity to live in rural West Virginia. I have
23 made friends, I have made people we consider aunts and
24 uncles, I have made all kinds of contacts, and I have been

1 shown by the Observatory that you can actually live your
2 dreams. It does happen here. You can see it. It's real.
3 You can touch it.

4 Also, I have a different background from a lot of
5 people that have spoken because I went into forestry. I
6 have had my certified -- arborist certification, and if you
7 want to talk about environmental impact, I know the
8 Observatory is very well maintained. I believe that the
9 sewage system won an award for being very environmental
10 friendly.

11 You talk about air quality. You can't get any better
12 air quality here. The telescopes would not be emitting
13 anything so I can't see how that would even be an issue.
14 That should be null and void because they listen.

15 To be honest with you, you can't get any better
16 water. This is the birthplace of seven rivers in West
17 Virginia.

18 I don't really know what else to say other than I hope
19 that you have listened to everybody and I hope that you
20 will definitely be taking this seriously because it is
21 affecting not just people here but it's worldwide. Even
22 though we are a very tiny state in the nation, we are the
23 third largest land county in the state, but one of the very
24 most rural populated areas, but it would be devastating to

1 see this place shut down. Thank you.

2 DI PANG: Hi. My name is Di Pang. I'm a Ph.D.
3 student at WVU. I'm studying computer science there. I'm
4 from China by the way so I'm from some rural area like
5 this. When my friends ask where I am I tell them I'm in
6 West Virginia. They don't know much about West Virginia
7 but they know two things. One is the song, Country Roads,
8 Take Me Home. The other one is the big telescope.

9 So in the past year, I've been working on
10 algorithms and look for pulsars in single pulse search so
11 pulses are weak and radio frequency interference is strong
12 so you don't know how sweet the words radio quiet zone
13 means to me. I really like those words.

14 You think of the GBT algorithms that's -- in
15 the past all those parts have to be diagnostically pulsar
16 signal part have to be inspected manually and there are
17 like hundreds of thousands of parts. We were able to
18 reduce this parts that need to be inspected by people by 90
19 percent and write up all of this so once we finished our algorithm,
20 this algorithm can be used by pulsars researchers, all pulsar
21 researchers, most specifically around the world, at the
22 universities as well.

23 So I'm also -- I came this summer to camp. I
24 met many talented students. Looking for -- we worked on

1 this pulsar. It's not we're only inspiring
2 people to study physics. Also inspire people to study
3 computer science, engineering, electronics.

4 In our department there are several professors who
5 work on the astronomy signal as well. So,
6 okay, we don't -- if you keep -- the students here want to
7 learn astronomy. You don't want to take them to China
8 because it cost a lot.

9 ELIZABETH PENTECOST: The next person. Anybody else?

10 JENNIFER NAIL: I want to say something.

11 UNIDENTIFIED: One, two, three, four.

12 JENNIFER NAIL: I was three or four. I can't
13 remember.

14 UNIDENTIFIED: You're a mathematician.

15 JENNIFER NAIL: I'm here now. They were just
16 pointing.

17 UNIDENTIFIED: We will come to you as well.

18 JENNIFER NAIL: Hello. I'm Jennifer Nail. I'm a
19 teacher at Pocahontas County High School. I also teach
20 math. What I want to talk about is the impact that this
21 has on our school systems.

22 Like Laurel talked about a minute ago, they
23 facilitated the field trip for our freshman class for the
24 last several years and this has been an incredible

1 opportunity for our students to see over the past few
2 years.

3 Also, guys, it's really hard to get people to move
4 here. I moved here from Charleston five years ago to teach
5 here because they offered me a contract first. There are
6 at least 20 school employees whose spouses work here. If
7 we lost 20 teachers we would not have qualified teachers in
8 our schools. As it is right now, I am proud to say that I
9 feel like we have a very strong school system and if that
10 happened we wouldn't.

11 It is so difficult to convince people to move here
12 because you're asking them to move here to the middle of
13 nowhere where your Internet is terrible and where they
14 don't have cellphones, and for people my age that's like
15 living without water so it's very important.

16 I would also like to talk on a personal note to when I
17 moved here five years ago I was a poor beginning teacher
18 and I needed a second job. So I worked here one summer at
19 the Observatory as a tour guide and I can say that that was
20 one of the best and most welcoming opportunities I've had
21 since moving to Pocahontas County. I met so many people
22 from working here and it made me feel so much more at home
23 than I was when I started here. I can say that if I didn't
24 have that opportunity I might not still be working in

1 Pocahontas County right now. So thank you.

2 UNIDENTIFIED: After this gentleman, who else has not
3 spoken before I go in the back of the room? Have you
4 spoken before? And you have not. We're going to take
5 people who haven't spoken first and then we will go back to
6 people who already had an opportunity and if they want to
7 supplement their responses because they ran out of time
8 they will be welcome to do that. We could even stay a
9 little bit later to accommodate that.

10 So the gentleman in the back will be after this
11 gentleman here. You can be after him. Who else was there
12 that wanted to speak?

13 UNIDENTIFIED: I was.

14 UNIDENTIFIED: You did. Okay. So oh do we have
15 another person here who didn't speak before? New speaker?
16 Did you speak already?

17 UNIDENTIFIED: No.

18 UNIDENTIFIED: So then you will follow this young
19 woman and then we will go.

20 BOB VANCE: I'm Bob Vance. First of all, I want to
21 say these people from the University of -- West Virginia
22 University, I was there a long time ago. I had an
23 astronomy class and you had to meet on top of the physics
24 building and we were supposed to look at stars. We

1 couldn't see anything but fog so when I
2 graduated I graduated with an education degree, math and
3 science.

4 I had to -- I spent one year teaching high school,
5 went in the service because I had a commission. Came back
6 to the Observatory in 1961 as a telescope operator because
7 we did everything manually at that time. That was the
8 requirement, they wanted math or electronics. So I spent
9 about three years as the operation group, 85 foot, 300
10 foot, and 140 foot. Then I moved to the computer group.

11 We didn't have much computer group at that time.
12 Computer science was not even one of the options in
13 Morgantown. From there I worked with all the astronomers
14 that came through. We had people from -- we had
15 astronomers from Russia. We had them from everywhere. The
16 staff was made up of several people from Germany. Well,
17 they just -- all kinds of foreign countries the staff was
18 made up of.

19 I was working the night that the 300 foot fell down in
20 1988 in the lab. And from that point Senator Byrd got
21 money to build the GBT and it was put into operation I
22 think in the year 2000 because I retired in 1999.

23 The telescope was a savior for the Observatory. It
24 was also a savior to the scientific community. The whole

1 community dearly loves that telescope and the observatory
2 is very -- it's a very economical part of the whole
3 county. There's several people who live in the outskirts.
4 Most of the people retired are still here or somewhere in
5 the neighborhood. It's not a good place to be. The
6 hospital and things are too far away, but they like Green
7 Bank and the Observatory is a very -- it's just a common
8 person for everybody, and I would like to urge the National
9 Science Foundation to do all they can to keep the GBT in
10 operation since it would also be a big morale booster for
11 the community as well.

12 BUSTER VARNER: I'm Buster Varner from Durbin. I'm
13 the local fire chief, president of the fire department --
14 rescue squad and fire departments for this area. I've
15 taken classes here for EMT class that Janet Ghigo has
16 taught every year here for several years that supplies the
17 EMTs for all of Pocahontas County. That's a very vital
18 thing here. I met a lot of people that has come here. Got
19 a lot of friends. My assistant chief is Dennis Egan that
20 works here. If we have problems with our trucks
21 ambulances, anything; I'm local business owner, I own
22 several businesses, if I need a special part or something
23 made I can have it made here.

24 Just I can't -- I've heard everybody talk and I

1 understand a lot of it, but business wise, how could you
2 take and spend the money you have spent in this area for
3 this telescope and this nice facility here and even for a
4 second think about closing it down? I can't understand how
5 this would happen. I mean, this is everybody's money and
6 we're known worldwide because of this telescope and all the
7 people that come here.

8 I think you're barking up the wrong tree. You need to
9 look at somewhere else to shut something down because if
10 this facility went out of here this would be a ghost town
11 in this area.

12 UNIDENTIFIED: Amen.

13 UNIDENTIFIED: Keep the money in America.

14 BUSTER VARNER: Yes. But I just want you to seriously
15 consider do not do anything different.

16 I can ask Mike Holstein for anything. We come here
17 when the helicopter crashed. Whenever the power goes out
18 or we have any kind of catastrophe here I can go to Mike.
19 I know I went to Mike when the power was off. They had a
20 scheduled power outage and a friend of mine had passed
21 away. Wasn't going to have no power at the funeral home
22 that day. I called Mike up. Mike, got a problem, buddy.
23 What is it. I said, well, lady is going to be at the
24 funeral home at two o'clock for a funeral, there's not

1 going to be any power there. It was really hot that day.
2 I will take care of it. What more can you ask for?

3 So this is things that goes way beyond what you
4 think. I don't know much about this science or nothing
5 like that. There's a lot of people here that does and
6 that's great. But I do not want to see anything to happen
7 to this facility. Period.

8 MARY SUE BURNS: My name is Mary Sue Burns, and I
9 moved to Pocahontas County in 1980 because I was offered
10 the job of Green Bank Middle School science teacher. That
11 was when the building was condemned and I had to work in
12 temporary housing down at the high school.

13 In 1985 I was talked into transferring to Pocahontas
14 County High School. I fought to be the chemistry teacher
15 which was fine and they said oh, by the way, you have to
16 teach the physics class, you're all we've got. You've got
17 enough credits we can get you a permit. Okay.

18 Teaching physics was the last thing I had ever
19 considered and it so happened that in 1987 -- I kind of
20 struggled along there a couple of years. In 1987 the
21 Investigating the University Workshop for teachers pilot
22 project for West Virginia teachers was held here at at that
23 time NRAO and a group of West Virginia teachers were
24 intensively trained in radio astronomy. We called it radio

1 astronomy boot camp.

2 From that I not only learned a lot but I made
3 incredible contacts and realized the tremendous resource I
4 had here and ended up making kind of lifelong collaborative
5 relationships with astronomers and engineers here who then
6 mentored my students and the kind of trickled down effect
7 from that was tremendous.

8 I was also on the staff for that project that
9 Ms. Bland mentioned, the Earth Space Science Passport grant
10 in collaboration with Fairmont State University. We
11 trained 36 West Virginia teachers in new science standards
12 this summer.

13 I was on the geology team so even though this is an
14 astronomy facility we were able to find sites within NRAO
15 and Green Bank, NRAO at that time, and Green Bank in order
16 to reconstruct geologic history of this area and give
17 teachers the inquiry experience into that kind of research
18 as well as the astronomy research so I think we have a rich
19 facility here and I would really like to see it
20 maintained.

21 I just retired from 37 years of teaching science in
22 West Virginia and in a moment of insanity agreed to long-
23 term sub position back at Green Bank Middle School so I
24 will be here for the science fair on December 6th and I

1 know that a lot of the staff here are going to be serving
2 as judges and hosts for that event, and I want to thank
3 them for that because a lot of them are here right now, and
4 thank you all for coming and listening. I tend to talk
5 really fast so this guy is good here. Thank you very much.

6 UNIDENTIFIED: And after our next speaker do we have
7 anybody else who has not had the opportunity to speak that
8 would like to?

9 UNIDENTIFIED: I would like to say something.

10 UNIDENTIFIED: Anybody else? No. Okay. Then you
11 were first. Did you want to speak?

12 UNIDENTIFIED: I already spoke but I want to go
13 again.

14 UNIDENTIFIED: Okay. So we will go after her go to
15 the other new speaker and then you and then you and then
16 you. Thank you, folks.

17 DIANE SCHOU: My name is Diane Schou. I'm a resident
18 of Green Bank and I did not check the form to talk but I
19 sort of gathered --

20 UNIDENTIFIED: You're on it now.

21 DIANE SCHOU: Thank you. I'm coming to about -- want
22 to talk about Green Bank from another direction, another
23 perspective. One, about air quality in Green Bank. This
24 is something that is very rare in the world here to be in

1 the national quiet zone.

2 I was injured by a cell tower that was built a third
3 of a mile away from my home. I didn't argue with it all
4 because I'm told that it was safe. Nine months later I got
5 symptoms of radiation sickness. I had a headache. I slept
6 very rarely. I had, what do you call it, chronic fatigue.
7 I had a rash. I thought I was eating something wrong. I
8 lost hair. I thought I was getting older.

9 My son took a class or was studying for a hand radio
10 license and in that book of learning about getting the hand
11 radio license there was a chapter about the radio -- the
12 hand radio operators what they experience when they stand
13 in front of antennas, and he put two and two together that
14 that sounds like what mother has.

15 My husband is a scientist so we did some simple
16 experiments. He drove me away from home, my headaches
17 disappeared. I felt much better. Came back home, the
18 headache returned and this happened repeatedly. When I was
19 returning home from the grocery store or from the post
20 office I was driving up top of a hill heading home and as I
21 approached the top I had a headache that was sort of like a
22 sledge hammer hitting me on my head. When I was coming
23 from another direction maybe about ten miles away I had a
24 tiny headache. Just barely discernible but the closer and

1 closer we got to home the headache grew. Because of that
2 is why I'm living here in Green Bank because I can live --
3 I'm acute person here. I don't have the health effects.

4 Am I running out of time?

5 CHRISTIN HAMILTON: You still have another 30
6 seconds.

7 DIANE SCHOU: Oh dear. I want to talk about safety
8 and health. I want to talk about the socioeconomic of
9 being in Green Bank. The historical preservation of
10 needing to keep this as a radio quiet zone and keep it as a
11 safe area because people around the world come here. Their
12 health improves, they go back home, they become ill again.
13 They come here, their health improves. They go back
14 home -- but they have to go back home because their family
15 is important.

16 From another perspective, instead of just asking for
17 the first preference for the Observatory, I would like to
18 ask for additional funding so that we can have some meters
19 to prove that people like me we are detecting things
20 because why on some days I feel ill, another person feels
21 ill, a third person feels ill, a fourth person had an
22 accident because that person was feeling ill. I even
23 called Virginia. They were feeling ill. I even called
24 Indiana. That person was feeling ill. So why were all

1 these people at the same hour detecting something. Thank
2 you.

3 LAURA HEIST: Hi. Most of you all know me. My name
4 is Laura Heist. We've lived in this area for a long time.
5 My husband is a tenth generation Pocahontas County
6 individual. We love this area for how unique it is and it
7 is unique in part because of the National Science
8 Foundation funding this observatory here.

9 I work for the Forest Service and I'm able to work at
10 home and work for Milwaukee, Wisconsin, and it's great to
11 be able to choose where you want to be and this is a
12 special place.

13 I would ask that you would look at the direct,
14 indirect, and cumulative impacts of the economic impacts to
15 the local area, to the state, and I'm just really wondering
16 just like they've said before, why are we spending so much
17 money to get this here and to invest in it and then to just
18 walk away with that much money? You may say it is outside
19 of your NEPA scope, but I'm asking you to look at it, and
20 if you're going to dismiss it for consideration, I would
21 like you to explain why you're dismissing it from
22 consideration. We want to know why you would be putting
23 money down in Chile instead of spending money in the United
24 States.

1 Whether you like him or not, we have a new president
2 who says he wants us to invest in America. I'm asking you
3 to invest in America and this is a great place to do it.
4 You've already put the money here so explain to me why you
5 would want to deinvest from this area. You can say that your
6 scope of your analysis is just to look at the alternatives
7 of what to do with this facility, but did you ever do the
8 analysis to come to this conclusion? I would just like to
9 understand it more and I think you can provide that
10 information in your response to comments to the public.
11 Thank you.

12 UNIDENTIFIED: No more new speakers; correct? I think
13 she was first and then you're next.

14 CARLA BEAUDET: Okay. To pick up where I left off and
15 actually -- Carla Beudet. I work at the Observatory. To
16 pick up, the previous speaker kind of, you know, pointed to
17 the points I made earlier that the socioeconomic impact
18 needs to be quantified in ways that it has not been done
19 for the EIS at Arecibo.

20 But to pick up, there are other quantifiable costs to
21 the area that come from losing the many volunteer services
22 of Observatory employees and the sharing of our facilities
23 with the community. Observatory employees volunteer as
24 firefighters and EMTs, as volunteer teachers of aerobics,

1 yoga, Zumba, Taekwondo, as sound and lighting engineers at
2 the Marlinton Opera House, as soccer, basketball, football
3 coaches and that is by no means an exhaustive list.

4 The Observatory partners with the parks and rec office
5 to offer swimming and dance lessons at Observatory
6 facilities for minimal cost. This in a place where the
7 nearest municipal swimming pool is at least an hours drive
8 away.

9 The impact to the community of losing the pool and the
10 exercise room can only be assessed by considering the cost
11 of a municipal wellness facility to replace those
12 services. Will your EIS consider that?

13 As my husband and I have been the ones doing sound and
14 lights at the opera house for the past 12 years we've
15 looked into the cost of having an outside sound company
16 come in. About \$1500 per show maybe 14 shows a year.
17 These things can be quantified and I want to see them
18 quantified in the Green Bank EIS if only estimated.

19 I cannot finish without expressing my disbelief that
20 this is even happening. The NSF's recommendation to defund
21 the GBT left a lot of people, particularly a scientific
22 community of users, completely dumbfounded given the recent
23 construction, innovative design, and scientific vitality of
24 this instrument. the GBT's capability has continued to

1 evolve. It is, in fact, just coming into its own with
2 high-frequency multi-receivers.

3 This is no dinosaur but rather a cutting edge
4 instrument with sensitivity unattainable by any array of
5 smaller dishes. It's capable and these are absolutely
6 unique in the scientific community. Just
7 not apparently from the majority of scientists selected to
8 serve on the NSF's 2012 Portfolio Review Committee. Thank
9 you.

10 PEGGY HAWSE: Good evening. I'm Peggy Hawse. I'm
11 Senator Manchin's representative and I work in West
12 Virginia. I represent him in Pocahontas County, and I've
13 already spoken. I've been here since three o'clock and I
14 stayed because I feel it is so important. The senator
15 thought it was so important that he also sent his
16 legislative director from Washington, and unfortunately, he
17 had to leave because he had to go to Charleston so I
18 stayed.

19 I wanted to add those of you who came in late, don't
20 worry, I'm not going to give my comments again. Just a
21 couple. There were representatives here earlier from
22 Senator Capito's office. Excuse me. Congressman Jenkins
23 was here, Senator Boso was here, and there may have been
24 some other locals that were here so it is important and

1 certainly your West Virginia delegation recognizes that.

2 I'm only going to make just a few comments repeated.

3 First, I want to say to the WVU students you have made a
4 tremendous impact by coming tonight. Thank you. I have
5 been privy to sit here and listen to everything and there
6 have been so many great comments made but I have to tell
7 you when you started speaking from your heart and there are
8 others have spoken from their heart, too, but you have come
9 here, you've chosen to come to West Virginia University to
10 further your experience to share your expertise. You made
11 a decision to do that. You're not getting a paycheck at
12 Green Bank Observatory. This isn't a job here for you.
13 You are passionate and that came through, and from a local
14 standpoint from somebody from West Virginia, you have made
15 me so proud and I want to thank you for that.

16 I want to tell you what the senator is doing
17 tomorrow. Tomorrow -- let me find my note here. Tomorrow
18 afternoon Senator Manchin along with Senator Capito and
19 Congressman Jenkins will speak directly to the Director
20 France Cordova, the director of the National Science
21 Foundation. I hope I'm saying the name right. To ensure
22 that she understands the importance of the Green Bank
23 Observatory to this community, the surrounding region, and
24 the State of West Virginia as well as the USA.

1 Senator Manchin thanks you for coming, and I want to
2 add one more thing. As a member of the Congress Committee,
3 Senator Manchin will have the responsibility of
4 interviewing and confirming the next director of the
5 National Science Foundation. We would like to do
6 everything we can to ensure your voice and your concerns
7 are held at the highest levels.

8 Mr. Vance, you called the Green Bank Telescope a
9 person. Well, when I gave my comments earlier I said that
10 the Green Bank Telescope was my friend. When I started
11 coming here I started calling it the Great Big Thing, and I
12 said, you know, you give nicknames to your friends so the
13 Green Bank Telescope has become my friend, and I'm so happy
14 to know that it has friends all over the world. Thank you.

15 DR. KATHRYN WILLIAMSON: Hi again. My name is Kathryn
16 Williamson. I'm a professor at WVU. I talked about the
17 20-meter telescope and how my students use it on Skynet
18 They control it online. It kind of worried me I heard that
19 I was the only person who mentioned the 20-meter because
20 it can be used online from anywhere and students from
21 more than WVU, more than just the hundreds the students
22 who take my classes use it. Students from all over the
23 country use it and I, unfortunately, don't know how many
24 but it's in the tens of thousands.

1 Earlier this year in January I submitted a grant to
2 the NSF to create workshops and activities for college
3 astronomy with the American Astronomical Society, the
4 people who offer the teaching workshops are there so that's
5 with EWAS people, and with other universities around the
6 country, and that grant review did extremely well but was
7 not funded because of the uncertain future of Green Bank
8 and the 20-meter.

9 Our grant had funding in there for it and it's just --
10 it blows my mind that the NSF would choose to know best for
11 one facility and ask for amazing educational opportunities
12 and then review those very well and then not
13 fund it because of the NSF's own decision so I just want to
14 reiterate that the 20-meter is an important telescope.
15 Everybody talks about the GBT, it's amazing, the 40-foot
16 telescope is an amazing opportunity, but the 20-meter
17 telescope is connected to the Internet so the possibilities
18 are endless for education. You don't have to come here.
19 It doesn't cost much of any at all to bring that kind of
20 quality science to our students so I just want to reiterate
21 the importance of the 20-meter. Thank you.

22 UNIDENTIFIED: Promised him first. And then, again,
23 we will have a hard stop at 8:30 if anybody else wants to
24 consider speaking.

1 DR. RYAN LYNCH: Okay, I will make it quick. I'm Ryan
2 Lynch. I'm a staff scientist here. So I talked earlier
3 about the student program and I want to just mention that
4 there's very, very few places in the world that allow
5 students to come and get a hands-on experience at a
6 telescope like this, but having gone through grad school I
7 came here first as a student back in grad school ten years
8 ago and now I'm here as an employee. It wasn't just
9 because I got to use a telescope which is great for my own
10 personal research. If that was all that this facility
11 offered I wouldn't be back here today as an employee.

12 Our summer students who come here they don't just
13 leave having had an experience. They learn something.
14 They walk away with the thing that I think I've taken away
15 from every comment here so much which is that this is such
16 an incredible community with such an incredible network of
17 people in every aspect of making this place work and the
18 community around it supports it.

19 When people come here they recognize that and it
20 inspires them to keep working through a career that can
21 often be very difficult or stressful. It helps get them
22 through those difficult times, and you can't really
23 quantify that easily, but it's a huge, huge, huge cultural
24 impact on the students that come here, on the other

1 astronomers that come here, and on every single person who
2 comes here to work and be a part of the community so I just
3 wanted to -- that was my time to speak from the heart.
4 Thank you.

5 UNIDENTIFIED: Anybody else want to speak after him?
6 You do. Okay.

7 PETE GENTILE: Pete Gentile again. I don't think I
8 mentioned it the first time but I'm a grad student at WVU
9 and I wanted to mention because it might seem a little
10 funny actually for people to have an emotional connection
11 to a telescope or to an observatory, and as hard as it is
12 maybe to understand it's much harder, I think, to quantify
13 that so it struck me tonight how many people said or
14 embodied the phrase I didn't sign up to speak tonight but I
15 wanted to get up and say something.

16 I think that's really indicative of the emotional
17 connection that this observatory has, not only with this
18 community but with the state and all of us here so I just
19 didn't want it to go without mentioning at least once how
20 emotion plays a part, even tonight. Thank you.

21 DR. LOREN ANDERSON: Hi. I'm Loren Anderson. Again,
22 WVU professor. One point I didn't think I had time for
23 last time was the amount of grant money that is tied to the
24 GBT so over the last few years we've been very successful

1 as faculty at WVU in bringing in money that is associated
2 with observation conducted on the GBT and that number is
3 almost \$10 million over just the last few years.

4 Most of that money goes to funding personnel. That's
5 post-docs and grad students and they spend it in the
6 community mostly on pizza and beer as far as I can tell so
7 those are good West Virginia dollars that stay very local
8 when you bring in those monies which we've been very
9 successful doing. Thanks.

10 UNIDENTIFIED: I believe this is our last speaker.

11 REBECCA GARVER: My name is Rebecca Garver, and I'm a
12 community member here. I honestly have no idea why I
13 decided to talk, but I just want to voice my concerns. I
14 completely get what everybody is saying but I want to say
15 from my perspective I don't think you understand how
16 devastating this would be to this community without this
17 here. It would be horrific. Buster Varner said it would
18 be a ghost town. He's not kidding.

19 My husband works at the high school. I'm not so
20 concerned about us not having good schools if this were to
21 close and the teachers were to leave; I worry about us
22 having no school. I worked at the bank across the street.
23 A couple years ago when we were worried this was going to
24 go down we were terrified there we were going to lose our

1 jobs because of how close we are and all of the community
2 members that we needed for our business. This would
3 trickle down to every single aspect of this community and
4 it would be an absolute nightmare for here and I just don't
5 want to see that happen. I couldn't sit and not say
6 anything.

7 UNIDENTIFIED: Amen.

8 UNIDENTIFIED: Thank you all so very much for coming
9 out. I know it's been a long day for many people and I
10 know it's hard to add something like this on at the end of
11 a long day or whatever endeavor you're involved in.

12 We thank you very, very much. We're going to take the
13 comments back, look at them, and review it, and they will
14 help shape the preparation of the draft of the
15 Environmental Impact Statement which is the next phase of
16 this process.

17 So, again, that will be -- we expect roughly spring of
18 next year we will be issuing the draft Environmental Impact
19 Statement. Thank you again. Be safe driving home.

20 (Whereupon, this meeting
21 was concluded at 8:30 p.m.)

22 - - -

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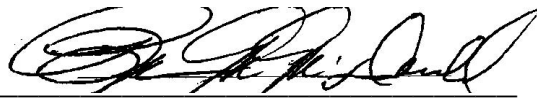
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CERTIFICATION OF REPORTER

I do hereby certify that the above and foregoing is a true and complete transcription of my stenotype notes and electronic recording of the meeting held at the time and place aforesaid.

I further certify that I am not interested in the outcome of this case, nor am I related to any of the parties herein.



Brian M. McDonald

Certified Shorthand Reporter

<hr/> <p style="text-align: center;">\$</p> <hr/> <p>\$1.5 32:12 \$10 76:3 \$11.5 8:17 \$11.85 8:20 \$1500 69:16 \$41,000 25:6 \$8.2 9:1,6</p> <hr/> <p style="text-align: center;">1</p> <hr/> <p>10 7:2 100 20:3 106 9:22 13:14 14:4,12 17:1 11 33:4 12 40:8 69:14 13-074 7:23 8:5 14 69:16 140 20:3 59:10 15 23:12,14 30:6 17 46:22 1961 59:6 1980 62:9 1985 62:13 1987 62:19,20 1988 59:20 1999 59:22 19th 12:8 14:23 1st 8:4</p> <hr/> <p style="text-align: center;">2</p> <hr/> <p>2 5:20 20 23:12,14 30:7 47:18 57:6,7 20-meter 18:8, 14 19:4 72:17, 19 73:8,14,16, 21 2000 59:22 2009 42:22 2010 6:10,19 7:8</p>	<p>2012 6:21,24 7:9,20 70:8 2013 7:21 32:10 2014 40:3 2016 7:6 8:4 2017 8:16,19,24 9:2,4 2018 8:21 9:1 16:1 22nd 7:21 27 28:12</p> <hr/> <p style="text-align: center;">3</p> <hr/> <p>3 11:7 30 15:3,21 66:5 30-day 14:24 300 59:9,19 34 24:20 36 63:11 37 63:21</p> <hr/> <p style="text-align: center;">4</p> <hr/> <p>40-foot 18:7,11 73:15 43rd 27:23 45-day 15:11 48 28:8</p> <hr/> <p style="text-align: center;">5</p> <hr/> <p>50 21:11</p> <hr/> <p style="text-align: center;">6</p> <hr/> <p>600 32:11 62 46:19,20 6th 63:24</p> <hr/> <p style="text-align: center;">7</p> <hr/> <p>75 9:6</p> <hr/> <p style="text-align: center;">8</p> <hr/> <p>85 59:9 8:30 73:23</p>	<hr/> <p style="text-align: center;">9</p> <hr/> <p>90 55:18 95 7:20</p> <hr/> <p style="text-align: center;">A</p> <hr/> <p>abilities 23:18 ability 31:4 41:11 absolutely 25:15 46:7 70:5 abstract 40:14 academic 33:15 45:18 Academies 7:6 accent 44:18 access 36:15 accident 66:22 accommodate 15:13 58:9 accomplishments 27:8 account 31:24 accounted 30:8 accurate 4:13 Act 11:17 13:15 14:15 15:18,19 action 10:11 actions 11:20 13:18 activities 14:16 73:2 activity 21:14 acute 66:3 Adam 45:4 49:11,13 add 44:2 70:19 72:2 addition 52:10 additional 66:18 address 20:2 45:9 46:2 addressed 12:15 addressing 53:18</p>	<p>administration 27:16 Advancing 6:22 adverse 13:23 advertised 36:14 advice 6:8 advisor 32:9 advocate 45:10 aerobics 68:24 aerospace 39:21 Affairs 5:18 affect 14:16 affected 20:7 affecting 54:21 affording 24:13 Africa 36:11 afternoon 71:18 age 34:3 57:14 agencies 11:18 13:15 agency 15:23 agreed 63:22 agreement 8:10 14:1 ahead 29:18 53:14 air 13:10 22:3, 4 48:12 54:11, 12 64:23 airstrip 22:3,5 Ajhar 4:3,4 5:9 11:11 13:4 Alabama 49:15 Alan 26:5 27:11,22 Alex 24:5 algorithm 55:19,20 algorithms 55:10,14 alive 51:1 allocated 9:1 allowing 39:19 alternative 10:11,21 52:16 alternatives 4:21 5:3 10:4, 7,9 11:3 12:18 13:3 52:8 68:6</p>
---	--	--	---

amateur 32:23	63:16 66:11	astrophysics	Balogh 26:5
amazing 43:13	67:4,6,15	6:1,11 42:4	27:22
50:10 73:11,	68:5,21	attached 16:9	bank 4:6,16
15,16	areas 5:4 12:18	attend 49:15	5:11 6:23
ambulances	13:7 35:13	attended 11:8	7:19,24 8:2,6,
60:21	39:10 41:3	43:10 45:15	7,9,13,18,23
Amen 61:12	44:11 54:24	47:18	9:7,10,13,23
America 39:14	Arecibo 9:23	attending 11:7	12:5 21:9,10
61:13 68:2,3	35:18 36:8	38:18	23:4,7,13,17
American 9:12	68:19	attorney 11:13	24:18,21,23
73:3	argue 65:3	attract 44:24	25:7 26:11,15
amount 27:4	argument 20:24	attracted 31:19	27:10 28:4
35:21 37:6	Armentrout	attraction	31:13 33:7,11,
43:18 75:23	34:14 37:16	28:11	14,23 34:2,6,
analysis 6:16	Army 22:17	attractions	11 37:8 38:24
12:12,23 68:6,	array 36:6 70:4	28:13	39:4,5,23
8	art 29:6,9	audience 30:8	40:20 41:16,22
Anderson 29:21	aspect 26:12	38:19 40:4	42:4,11,24
30:1,2 75:21	47:14 74:17	August 7:6	43:1,2,14
animals 29:7	aspects 13:9	AUI 8:8	44:13,22 45:14
announced 7:23	assessed 69:10	AUI's 8:22	47:1,18 49:2
12:7	assessment 7:8	aunts 53:23	60:7 62:10
announcing 17:5	13:23	Australian	63:15,23
antennas 65:13	assistant 60:19	44:18	64:18,22,23
ants 29:8	astounding	authentic 18:21	66:2,9 69:18
anybody's 52:14	33:22	19:5,12	71:12,22 72:8,
Apollo 33:4	astronomer 5:9	award 54:9	10,13 73:7
Appalachian	30:4 39:9 43:6	aware 28:9	76:22
26:14	astronomers	awe 33:7	barely 65:24
apparently	32:24 36:14,18	awesome 34:5	barking 61:8
52:13 70:7	38:2,24 39:7,		base 9:7 38:15
applying 31:9	11,12 59:13,15		based 6:1 18:6
appreciates	63:5 75:1	B	Baseline 8:18,
37:2	astronomical		24
approached	5:10,13 6:9,20	back 5:14,22	basic 13:20
65:21	8:17 9:17,20	17:13 24:4	19:8
appropriated	16:20 37:7	26:1 34:3,4	basically 36:19
9:3	73:3	36:22 38:21	basics 38:7
appropriations	astronomy 6:1,	40:3 45:23	basis 29:10
9:8	7,11,12,14,22	51:21 58:3,5,	basketball 69:2
approximately	7:10,15 8:1	10 59:5 63:23	Bean 27:11
9:6	19:3,5,7,9	65:17 66:12,	Beaudet 68:14,
arborist 54:6	24:22 26:14	13,14 74:7,11	15
area 13:22	31:8,11,20	background 5:1,	beavers 29:8
21:22 22:7,9,	33:8,15 34:19	2 46:5 53:19	beer 76:6
16,18,22	35:11,13,16	54:4	began 12:8
23:12,13 24:1	36:2 38:6	backgrounds	14:24
27:2 28:10	39:22 43:6,8,	18:20	begin 51:16
30:10 35:16	10 50:20,21	bad 19:11	beginning 4:20
37:23 55:4	56:5,7 58:23	Baker 39:17	10:1 12:7
60:14 61:2,11	62:24 63:1,14,	41:18	34:20 57:17
	18 73:3		

behalf 39:19	bringing 76:1	capability	chores 50:1
beings 20:18	brings 39:6	69:24	chosen 71:9
benefit 20:15	43:18	capable 70:5	Chris 5:21
50:23	broader 42:22	capitalize 6:17	Christin 5:17
benefits 23:16	Brook 43:23,24	Capito 71:18	11:4,5,6 24:2
BFD 21:21	brought 5:2	Capito's 70:22	51:21 66:5
big 21:15 35:13	31:1 39:23	care 62:2	Christina 53:15
45:2 55:8	42:2	career 44:7	chronic 65:6
60:10 72:11	Bryant 24:5,6,	74:20	churches 49:7
bigger 35:19	10	careers 29:1	circle 33:16
biggest 23:4	buddy 61:22	carefully 21:17	cities 19:10
36:3	budget 8:15,16	Carla 68:14,15	clarify 8:14
billion 27:1	9:2,5,7,18	Caroline 5:16	11:12 12:21
binary 46:16	29:13	Carolyn 27:12	class 18:19
biological	Budget also	carries 49:17	19:4 46:19,21,
13:10	8:19	catastrophe	23 56:23 58:23
biology 25:18,	budgetary 16:6	61:18	60:15 62:16
19	budgets 9:15	cease 6:14	65:9
birthplace	build 59:21	cell 65:2	classes 25:22
54:16	building 25:5	cellphones	60:15 72:22
bit 15:1 20:22	37:1 50:8	57:14	classroom 46:11
37:18 58:9	58:24 62:11	Center 18:17	classrooms
black 35:10	built 21:7 33:3	41:19 42:19	32:22
Blanco 4:3 5:17	65:2	centimeters 7:3	climb 48:12
Bland 24:6,7,9,	bunch 44:8	Central 26:14	close 4:16
12,14 63:9	Burns 62:8	ceremony 8:12	32:5,16 41:23
blanking 41:7	business 20:6	certification	76:21
Blond 24:6	60:21 61:1	54:6	closed 31:21
blows 73:10	businesses	certified 22:6	closer 65:24
Blue 33:5	20:12 60:22	48:12 54:6	66:1
Board 24:16,17	Buster 60:12	CH 5:20	closing 27:3
boards 16:22	61:14 76:17	Challenges 6:23	61:4
Bob 58:20	Byrd 59:20	chance 38:22	closure 35:7
book 49:4 65:10		changed 33:24	club 26:15
boos 48:14		chapter 65:11	28:17 32:24
booster 60:10		Charleston 57:4	clubs 34:4
boot 63:1		70:17	co-sponsor
Boso 70:23		Charlottesville	26:15
bottom 38:1		42:24 43:3	coach 46:5
44:22		check 14:10	coaches 69:3
Boy 48:6		64:18	coal 41:14
Boys 27:11		chemistry 62:14	code 46:12,13
brain 45:21		chief 60:13,19	coding 46:15
48:18		child 47:13	collaborate
brave 46:8		Chile 67:23	27:14
Breakthrough		China 36:11	collaboration
9:11		55:4 56:7	10:13 34:18
bring 22:8 23:3		choices 31:10	41:21 47:1
30:14 73:19		choose 67:11	53:3 63:10
76:8		73:10	collaborations

8:2 9:9,10 10:16 collaborative 63:4 Collaboratory 33:11 38:4 colleague 7:22 8:5 17:4 collected 19:14 collectively 32:10 college 18:20 33:24 43:5 46:22 73:2 combined 9:18 comment 10:6 12:20 15:1,11 16:11 17:4 29:3 74:15 comments 4:19 5:8,15 10:6,8 11:1,2 12:13 14:23 15:3 16:7,8,10,12, 14 17:10,12 18:10,24 19:21 51:14 68:10 70:20 71:2,6 72:9 commission 59:5 Commissioner 20:1 Committee 70:8 72:2 committees 6:9 7:18 common 60:7 commonplace 50:12 communicate 40:11 communications 26:16,21 communities 20:6 36:22 48:4 community 6:9 9:17 21:11,13 25:24 26:11 34:19,22 35:4 36:20 37:7,8, 12,23 38:10	39:5 42:22 43:8 49:3,8 59:24 60:1,11 68:23 69:9,22 70:6 71:23 74:16,18 75:2, 18 76:6,12,16 companies 20:12 company 20:14 69:15 compared 47:9 competition 8:1 complete 6:12 17:12 completed 6:21 36:12 completely 69:22 76:14 compliance 11:13 computer 33:13 46:3,6,20,21, 24 55:3 56:3 59:10,11,12 concerned 76:20 concerns 53:18 72:6 76:13 conclusion 68:8 Concurrent 13:13 15:17 condemned 62:11 conduct 6:4 conducted 76:2 confirm 14:12 confirming 72:4 Congress 72:2 Congressman 70:22 71:19 connect 33:19 39:11 49:23 connected 73:17 connecting 50:1 connection 30:13,24 31:2 33:7,8 34:8 75:10,17 consequences 11:19 consideration 34:21 67:20,22	considerations 16:2 considered 10:21 26:24 62:19 considers 16:1 48:15 constantly 48:16 constraints 9:19 12:5 16:6 construction 6:15 69:23 consult 13:16 14:18 consultation 9:22 13:14 14:13,20 15:19,20 17:1 consulting 14:7,9,13 contacts 53:24 63:3 context 35:19 continue 19:3 20:9 25:4 28:2 37:10 42:5 43:9 44:24 continued 10:10 69:24 continues 8:8 9:13 21:18 continuing 9:4 43:12 contract 57:5 contractors 5:20 contribute 36:24 48:3 contribution 52:5 53:9 control 33:12, 14 72:18 conversation 44:21 convince 57:11 convinced 31:3 cool 28:13 33:16 45:12,18 46:17 47:20,21	cooperative 8:9 25:20 47:5 coordinate 22:19 coordination 14:2 coordinator 34:16 copies 16:22 Cordova 71:20 core 36:19 Cornell 43:10 correct 68:12 Cosmology 41:20 cost 20:14 56:8 69:6,10,15 73:19 cost-benefit 20:12 costs 68:20 Counsel 5:16 11:5,12 countries 59:17 country 19:7 27:7 30:19 52:4 55:7 72:23 73:6 county 20:1,6, 7,8 22:2,8,13 24:16,17,19,24 25:19,23 26:2, 12 28:14,19,20 45:11 46:5 47:12,22 52:4, 7 53:20 54:23 56:19 57:21 58:1 60:3,17 62:9,14 67:5 70:12 couple 30:15 32:20 62:20 70:21 76:23 crashed 61:17 crazy 33:16 Creager 46:10 create 73:2 created 27:4,5 credits 62:17 critical 7:3 Cross 22:6
---	--	---	--

cross-disciplinary 50:17	decided 53:21 76:13	detrimental 31:4	dishes 70:5
cultural 13:10 36:21 52:5 74:23	decides 30:20	devastating 54:24 76:16	dismiss 67:20
culture 29:6,18 37:1	decision 4:16, 18 15:23,24 31:24 42:8 43:8 71:11 73:13	developed 13:2 14:4	dismissing 67:21
cumulative 67:14	decision-making 11:21	development 12:9,21	dissertation 18:1 43:11
Cunningham 53:15,16	decisions 11:21	developments 7:19	District 27:23
curiosity 34:9	deconstruction 10:22 52:9	devest 68:5	diverse 13:9
current 8:14, 15,24 9:18 32:23	decrease 30:21	Di 55:2	divested 35:5
cut 37:6 49:21	Deep 33:5	diagnostically 55:15	divestment 6:24 7:10,11
cutting 70:3	deer 52:13	Diane 64:17,21 66:7	division 5:10, 13 8:23 16:21 35:13
D	defending 48:16	dictated 11:17	docs 30:9
	define 28:4	die 26:21	doctoral 37:17
	defund 69:20	difference 43:22	documents 16:19 17:1
	defunding 20:11 21:18	difficult 23:24 30:22 41:3 57:11 74:21,22	dollar 20:15 27:1 41:15
dad 40:2 53:21	degree 18:2 25:19 52:12 59:2	Dilley 43:23 45:6,8	dollars 20:22 76:7
dance 69:5	degrees 18:4	dinosaur 70:3	door 45:13
dark 18:18 19:9	delay 51:24	direct 5:15 67:13	doors 27:17
data 19:14 43:2 49:23	delayed 15:1	direction 64:22 65:23	Dot 33:5
date 10:20 13:2	Delegates 27:24	directly 11:2 71:19	downsizing 20:13
dates 14:22	delegation 71:1	director 4:8 24:14 26:17 70:16 71:19,20 72:4	dozens 38:21
daughter 25:17 26:1	Dennis 21:20,21 60:19	disappeared 65:17	draft 12:6 14:5,20 15:5 16:9 23:7 35:18
Dave 19:19,20, 22	department 21:22 30:6,10 31:7,18,20,22 44:9,10 56:4 60:13	disaster 22:8	drain 45:21
day 29:13,14 38:23 46:11 47:3 49:12 61:22 62:1	departments 30:18 60:14	disbelief 69:19	draw 38:10,18
day-to-day 40:19	depending 20:3	discernible 65:24	dreadful 52:10
days 15:3,21 66:20	design 69:23	discoveries 36:3	dreams 54:2
daytime 15:13	desktops 49:22	discovering 20:17 35:9	drive 69:7
deal 42:3	detached 40:17	discovery 35:16	driven 28:7
dear 7:22 8:5 66:7	detect 18:15 42:1	discussed 4:13 52:8	driving 65:20
dearly 60:1	detecting 66:19 67:1	dish 48:12,17	drove 65:16
decadal 6:10 7:4,8 35:15	detection 42:2		due 12:5 15:1 30:13 44:13 45:2 48:8
decade 6:8,22 27:18	determine 6:13		dumbfounded 69:22
December 17:23 63:24	detriment 41:24		Dunmore 24:1
			Durbin 23:24 60:12

E	<p>efficiently 10:20</p> <p>effort 41:24</p> <p>efforts 38:8</p> <p>Egan 21:20,21 60:19</p> <p>EIS 12:6,9,21 14:5,6,21 15:22 68:19 69:12,18</p> <p>elect 29:17</p> <p>electricity 22:15</p> <p>electronics 56:3 59:8</p> <p>Elementary-middle 24:21</p> <p>ELIZABETH 17:19 19:19 21:20 24:5,8,10 26:4 29:21,24 32:2,5 34:13 39:17 42:15 43:23 45:4,7 51:4,8,11,16,19 53:13 56:9</p> <p>embarrassing 41:7</p> <p>embodied 75:14</p> <p>emergency 21:12 22:7,16,24 23:2 26:17</p> <p>emitting 54:12</p> <p>emotion 75:20</p> <p>emotional 75:10,16</p> <p>employee 24:19 74:8,11</p> <p>employees 26:13 48:3 57:6 68:22,23</p> <p>EMT 60:15</p> <p>EMTS 48:8 60:17 68:24</p> <p>end 17:11 22:2 28:19</p> <p>endangered 14:15,17 15:19</p> <p>ended 43:7 63:4</p> <p>endless 73:18</p>	<p>engage 38:5,14</p> <p>engagement 38:17</p> <p>engaging 38:9</p> <p>engineering 7:7 39:21 45:24 56:3</p> <p>engineers 63:5 69:1</p> <p>England 44:6</p> <p>English 44:15,19</p> <p>enormous 52:5,13</p> <p>ensure 71:21 72:6</p> <p>enthusiasm 42:3</p> <p>entire 4:6</p> <p>entities 53:7</p> <p>environment 11:20 13:10 25:12 52:6</p> <p>environmental 4:5 5:6 9:21 10:3 11:9,13,14,17,19 12:2,4,12,14,22 13:7 15:6,15 16:1,3,9 34:23 52:12 54:7,9</p> <p>equipment 22:24</p> <p>essential 7:14</p> <p>Essentially 41:6</p> <p>established 9:10 21:8</p> <p>estimated 69:18</p> <p>evaced 22:3</p> <p>evacuation 22:4,7</p> <p>evaluate 12:3 13:7</p> <p>evaluated 12:17</p> <p>evaluation 12:22</p> <p>evening 11:6,10 15:13 24:12 31:6 70:10</p> <p>event 64:2</p> <p>eventually 44:19</p>	<p>everybody's 61:5</p> <p>evidence 19:9</p> <p>evolve 70:1</p> <p>EWAS 73:5</p> <p>exact 8:23 32:21</p> <p>excited 45:13</p> <p>exclusive 53:6</p> <p>Excuse 70:22</p> <p>exercise 49:10 69:10</p> <p>exercising 33:6</p> <p>exhaustive 69:3</p> <p>exist 14:18</p> <p>existing 6:17</p> <p>exists 34:24</p> <p>expect 13:7 20:2</p> <p>experience 18:22 19:6,13 30:17 42:23 46:17 63:17 65:12 71:10 74:5,13</p> <p>experiences 33:23 34:1</p> <p>experiments 18:15 65:16</p> <p>expertise 36:18 71:10</p> <p>explain 40:23 67:21 68:4</p> <p>exploration 53:5</p> <p>expressing 69:19</p> <p>extend 21:16</p> <p>extent 52:20</p> <p>external 6:8</p> <p>extraterrestrial 20:18</p> <p>extremely 73:6</p>
		F	
		<p>facilitated 56:23</p> <p>facilities 6:2,13,18 7:5,10,</p>	

12,15 8:17	47:3 56:23	forms 16:11	66:18 67:8
9:20 10:18	Fifteen 30:3	fortunate 27:10	73:9 76:4
22:19,20 23:3	figure 20:15	forward 9:16	funds 6:14
28:18 35:4	fill-in 36:6	16:24 46:1	funeral 61:21,
36:5,10,12,15	final 11:20	fosters 40:6	24
50:2,4,11,16,	12:6 14:6,21	fought 62:14	funny 75:10
22 51:2 52:18,	15:14,22 16:3	Foundation	future 6:18
22 68:22 69:6	21:10	5:11,24 8:6,10	10:20 19:24
facility 27:1,	Finally 10:21	16:5 19:23	35:14 36:10
6,13,20 28:2,	find 18:17 19:9	28:1 52:17	38:12 41:13
16,22 31:20	63:14 71:17	60:9 67:8	73:7
35:6 36:7 37:9	fine 41:8 51:19	71:21 72:5	FY 7:20 8:16
41:23 43:21	62:15	Foundation's	
61:3,10 62:7	finish 18:1	6:6	G
63:14,19 68:7	51:13 69:19	fourth 10:18	
69:11 73:11	finished 43:11	27:11 66:21	gain 14:20
74:10	44:5 55:19	France 71:20	gains 30:23
fact 13:4	fire 21:12,21,	Frankly 35:6	Galactic 18:17
16:15,22 70:1	22 22:1 23:6,	free 21:8	galaxy 20:17
factor 16:4	11 60:13,14	frequency 35:10	Garver 76:11
factors 31:18	firefighters	55:11	gas 18:15 41:15
faculty 30:2,15	68:24	frequently 36:1	gathered 64:19
31:1,3 76:1	first-year	freshman 56:23	gave 72:9
fair 48:1,2	25:18	friend 61:20	GBM 39:20
63:24	firsthand 18:6	72:10,13	GBO 19:24 20:2,
Fairmont 25:21	fiscal 7:20	friendly 54:10	4,10,14,16
63:10	8:15,19,20,24	friends 28:14	21:15,19 22:1,
fall 15:16	9:1,2,4	53:23 55:5	6,24 23:14
families 26:1	Fish 14:18	60:19 72:12,14	24:13 27:6
28:24	fixed 23:2	front 65:13	31:24 32:11
family 28:12	floods 22:13	frontier 35:16	46:13 47:15,17
66:14	floor 5:7	42:19	48:3 49:3,8
fantastic 36:7	focus 12:23	full 15:2 16:8	GBT 7:1 19:17
farming 28:21	focused 10:11	39:13	21:2 30:14
fast 36:11 64:5	fog 59:1	fully 21:2 33:2	34:18 35:5
fatigue 65:6	folk's 20:5	functioning	36:7 39:20
federal 5:24	folks 27:12	25:9	41:12 55:14
11:18 13:15	64:16	fund 32:14	59:21 60:9
feed 22:19	follow 14:11	49:10 73:13	69:21 73:15
feel 18:24	58:18	fundamental	75:24 76:2
57:9,22 66:20	foot 59:9,10,19	42:7	GBT's 69:24
70:14	football 69:2	fundamentally	general 5:16
feeling 33:6	forefront 43:13	4:14	11:5,11 21:15
66:22,23,24	foreign 48:22	funded 10:15	25:12 27:14
feels 66:20,21	59:17	20:20 29:16	29:3 31:23
fell 59:19	forest 48:13	73:7	42:6 44:17
fellow 34:2	67:9	funding 6:1,3	generation
41:19 42:18	forestry 54:5	7:21 9:14,19	38:14 67:5
felt 65:17	form 14:1 64:18	12:5 24:18	generators
field 33:5 36:3		28:2 30:20,21	22:12
45:14,24 46:14		34:10 52:18	

Gentile 32:3,4, 5,19 75:7	gravitational 9:12 35:10 41:19 42:1,2	44:9	headaches 65:16
gentleman 58:2, 10,11	great 21:11 28:19,24 40:23,24 41:12 42:3 44:8 47:24 48:13 51:1 62:6 67:10 68:3 71:6 72:11 74:9	grown 30:11	heading 65:20
geologic 63:16	greatest 21:5,6	growth 30:13	heads 49:24
geology 63:13	Green 4:6,16 5:11 6:23 7:19,24 8:2,6, 7,9,13,18,23 9:7,10,13,22 12:5 21:9,10 23:4,7,13,17 24:18,20,23 25:7 26:11,15 27:10 28:4 31:13 33:7,11, 14,23 34:2,6, 11 37:8 38:24 39:4,5,23 40:20 41:16,22 42:4,11,24 43:1,2,14 44:13,22 45:14 47:1,18 49:1 60:6 62:10 63:15,23 64:18,22,23 66:2,9 69:18 71:12,22 72:8, 10,13 73:7	Guard 22:17,18	health 47:11 66:3,8,12,13
Germany 59:16		guess 22:17 24:11 40:8 47:8 51:12	healthy 26:19
Ghigo 48:8 60:15		guide 33:13 57:19	hear 10:24 11:2 44:17 51:6
ghost 61:10 76:18		guy 64:5	heard 18:10 26:16 36:23 37:3,18 44:8 60:24 72:18
give 16:12 19:5 26:7 36:22 39:13 53:21 63:16 70:20 72:12		guys 43:24 48:23 57:3	heart 71:7,8 75:3
giving 26:10		H	heartily 21:16
goals 7:4		habitat 14:17 25:15	heat 22:15
Golden 25:13,14		hair 65:8	heavily 38:5
Gonzalez 26:4,6		halfway 23:24	heck 44:20
good 11:6 20:24 24:12 31:6 43:21 48:19 60:5 64:5 70:10 76:7,20		Hamilton 5:17 11:4,6 24:2 51:21 66:5	Heist 67:3,4
Goodall 45:4 47:8		hammer 65:22	held 62:22 72:7
government 53:6,7		hand 21:17 33:13 38:20 51:21 65:9,10, 12	helicopter 22:17 61:17
governor's 45:16		hands 53:6	helped 18:1 25:3 45:16
governor-elect 29:15		hands-on 30:17 74:5	helpful 12:20
grad 31:11,15 32:9 74:6,7 75:8 76:5		happen 20:7 33:20 54:2 61:5 62:6	helping 5:15,20 21:17
graders 46:14		happened 33:20 57:10 62:19 65:18	helps 23:9 74:21
graduate 30:7 31:7,9,17 32:7 38:18,19 43:9	grew 45:11 66:1	happening 20:19 33:21 69:20	herd 52:13
graduated 59:2	grocery 65:19	happy 72:13	high 25:19,23 32:22 33:24 46:3,17 47:4 52:12 56:19 59:4 62:12,14 76:19
graduating 46:19	ground- 5:24	hard 19:2 22:22 57:3 73:23 75:11	high-frequency 70:2
grandchild 47:13	ground-based 7:11,15	harder 75:12	high-impact 37:10 39:10
grant 32:12 63:9 73:1,6,9 75:23	groundwater 13:11	hardwiring 25:2	higher-ranked 7:4
grants 6:3	group 48:22 49:4 59:9,10, 11 62:23	hat 34:17	highest 72:7
Gravitation 35:11	groups 6:4 28:16 32:8	hate 17:9	highlight 39:10
	grow 25:4 41:9	Hawse 70:10	highlighted 35:12,15
	growing 25:5	head 65:22	hill 5:21 65:20
		headache 65:5, 18,21,24 66:1	hinges 42:9
			historic 13:15, 16,18,21,24 15:18 28:3

historical 66:9	hydrogen 18:15	including 12:17	inspire 56:2
history 36:4		30:4	inspired 18:7
63:16	I	income 41:3	34:2
hitting 65:22		Incorporated	inspires 74:20
hold 28:18	idea 35:13	8:8	inspiring 18:3
53:10	76:12	increase 8:20	33:4 56:1
holes 35:10	ideal 33:18	incredible	instrument
Holstein 61:16	ideas 8:2	56:24 63:3	69:24 70:4
home 33:2 34:3,	identification	74:16	instrumental
4 38:22 46:1	12:17 13:21	India 31:8	25:8,24
47:11 55:8	identified 13:3	Indiana 66:24	instruments
57:22 61:21,24	16:3	indicative	6:16
65:3,16,17,19,	ill 66:12,20,	75:16	insurance
20 66:1,12,14	21,22,23,24	indirect 23:16	23:10,11
67:10	Image 33:5	67:14	intend 12:3
hone 39:8	imagine 37:24	indirectly	intensively
honest 54:15	impact 4:5 5:6	21:23	62:24
honestly 76:12	7:12 9:21 10:3	individual	interest 14:12
honing 39:2	11:14 12:2,14	52:24 67:6	26:20 29:1
hope 19:16	13:8 15:6,15	individuals 6:4	38:11 44:11
31:23 32:15	16:3,9 19:16,	influence 12:11	interested
33:19 42:16	18 20:2 23:11,	inform 12:14	10:6,13,16
45:1 54:18,19	15 31:21	15:14	13:16 14:9,11
71:21	34:22,23 35:4,	information 5:1	17:7 45:22
Horizons 6:11	23 36:21 37:8,	13:1,5 14:3,5,	interesting
horrific 76:17	21 39:24 42:21	19 16:18 18:17	44:11
hospital 47:12	43:4,17 54:7	68:10	interface 38:3,
60:6	56:20 68:17	informational	23
hospitals 47:16	69:9 71:4	16:22	interference
hosted 47:3	74:24	informed 41:5	55:11
hosts 46:13	impacts 12:1,22	43:8	interject 41:10
64:2	37:11 67:14	initially 44:18	international
hot 62:1	implementing	initiating 9:21	6:2 31:17,19,
hour 46:13 67:1	7:12	Initiation	22 36:9 37:23
hours 32:11	importance 16:4	13:21	internationally
69:7	39:4 71:22	injured 65:2	43:19
house 27:23	73:21	innovative	Internet 24:24
69:2,14	important 4:15	69:23	57:13 73:17
housing 62:12	11:1,8 20:8	input 4:20 5:5	intervention
Hubbell 33:5	22:21 23:21	6:7 7:17	47:11
huge 36:21	26:23 28:5	12:11,16 15:5	interviewing
38:18 41:24	34:12 38:9,13	19:23	72:4
43:4,17 45:10	39:13 41:9,13	inquiry 63:17	introducing
47:5 50:23	44:10 49:18	insanity 63:22	4:23
74:23	50:14 57:15	inspected	invest 35:14
hundreds 18:19	66:15 70:14,	55:16,18	67:17 68:2,3
30:9 55:17	15,24 73:14	inspiration	invested 20:23
72:21	improves 66:12,	47:6	27:2
husband 48:9,20	13	inspirational	Investigating
65:15 67:5	in-depth 12:1	19:18	62:21
69:13 76:19	inauguration		
	8:12		

investigation 11:23	keenly 28:9	laundry 49:24	link 40:21
investigations 6:5	key 35:15	Laura 67:3,4	list 13:2,6 15:7,8 69:3
investing 36:17	kicking 8:13	Laurel 43:23 45:6,8 56:22	listed 14:16
investment 10:10 21:1 32:14	kid 28:21 34:3	lay 37:19	listen 9:11 54:14 71:5
invite 12:16 14:7 17:12	kidding 76:18	leadership 36:1,16	listened 54:19
involved 39:22 50:5 52:23	kids 25:23 33:11 34:4 40:24 41:9 45:19 46:12 47:20,23 48:6	learn 27:15 46:16 56:7 74:13	listening 64:4
involvement 42:10 52:17	kind 7:18 19:5 23:6,18 32:8 37:19 38:15 40:7,17,22 41:5,7,9 47:9 52:9 61:18 62:19 63:4,6, 17 68:16 72:18 73:19	learned 18:5 63:2	literally 33:12
involving 8:2	kinds 18:20 53:24 59:17	learning 38:6 65:10	literature 29:6
ISO 23:9	knew 49:2	leave 23:23 31:3 36:18,19 70:17 74:13 76:21	live 25:10 26:1 53:22 54:1 60:3 66:2
issue 15:2 54:13	knock 27:17	left 49:20 50:2 68:14 69:21	lived 67:4
issues 12:11,16	knowing 10:6	legislative 5:18 70:16	lives 40:16,19
Ivy 5:19	knowledge 50:20	Lesley 45:4 47:8	living 57:15 66:2
J	Kobelski 45:5 49:11,14	lessons 69:5	Liz 5:14 17:4 51:21 53:10
Janet 48:8 60:15	Kupec 5:19	lets 33:9 34:8, 9	local 20:3 28:16 30:10 32:17 60:13,21 67:15 71:13 76:7
January 73:1	L	letter 7:22,23 8:5 18:23 53:18	locally 43:19
Jenkins 70:22 71:19	lab 47:19 59:20	letting 4:11	locals 70:24
Jennifer 56:10, 12,15,18	laboratory 25:11	level 9:6 30:21 32:17,18	logistics 4:9
job 48:11 57:18 62:10 71:12	labs 19:7	levels 8:15 11:23 39:13 72:7	long 8:18,23 29:17 44:20 49:12 52:14 58:22 67:4
jobs 20:3	lacking 50:18	Leyzarek 51:4, 20,23	long- 63:22
Joe 26:4,6	lady 53:13 61:23	license 65:10, 11	looked 69:15
John 51:4,23	Lamb 42:16,17	life 34:1 39:24 47:14,17	Loren 29:21 30:1 75:21
joined 40:3	land 54:23	lifelong 45:10 63:4	lose 35:24 76:24
Joining 5:13	landing 22:4	light 19:11	losing 36:16 68:21 69:9
judges 48:1 64:2	large 18:22 22:19 34:22 35:22 36:6 37:8	lights 69:14	lost 21:18 57:7 65:8
K	larger 30:12	LIGO 42:2	lot 4:11 6:7 11:15 18:10 19:7 23:18,19 28:21 36:5,9 37:4 43:1 48:4 49:8 53:1 54:4 56:8 60:18,19 61:1 62:5 63:2 64:1,3 69:21
Karen 4:7 5:18	largest 21:2 33:2 54:23	limit 17:10	
Kathryn 17:19, 21,22 30:4 40:4 72:15	late 70:19	limited 35:18 43:7	
Kathryns 34:7	laughable 52:10		
Kaustubh 29:22, 23 31:6,7			

national 5:10, 23 6:2,6 7:6, 24 8:6,10 11:17 13:14 15:18 16:4 19:22 22:17,18 24:22 28:1 42:22 52:17 60:8 65:1 67:7 71:20 72:5	20,22,23 9:1, 19,21 10:10,15 16:14 20:9,20, 23 24:18 30:20 31:23 35:12, 13,20 50:22,24 51:2 73:2,10 NSF's 9:16 69:20 70:8 73:13	observe 25:14 observed 32:11 observing 39:6 41:23 occasionally 45:18 occupational 47:10 occur 11:23 14:2 occurred 35:8 October 8:4 12:8 14:23 offer 51:3,14 69:5 73:4 offered 57:5 62:9 74:11 office 5:16,18 11:4,11 29:18 65:20 69:4 70:22 officer 5:11 11:13 13:17 offices 49:22 Oftentimes 22:2 older 65:8 ongoing 6:15 27:5 online 18:9,14 36:10 72:18,20 open 5:7 27:21 37:13 open-skies 37:6 opened 40:2 opera 69:2,14 operating 9:3 operation 6:15 7:16 10:17 59:9,21 60:10 operational 12:4 operations 10:11,14,19,20 operator 59:6 operators 65:12 opportunities 6:23 14:23 43:7 45:19 50:24 57:20 73:11	opportunity 14:10 24:13 25:13 26:2,10, 18 28:24 32:21 50:16 51:13,15 52:1 53:22 57:1,24 58:6 64:7 73:16 optical 19:8 option 26:23 37:14 options 37:4,13 39:15 59:12 oral 11:2 order 6:14 63:15 oriented 28:22 outage 61:20 outages 22:14 outdated 35:7 outlined 13:20 outreach 38:1, 7,8 40:5,6,10 outskirts 60:3 overnights 48:7 overseas 29:13 owner 60:21 Oxford 44:6 oxygen 22:11
nationally 13:18 43:20 natural 25:15 41:15 nature 12:1 28:17 33:7 Navid 42:15 nearby 23:6 nearest 69:7 needed 6:17 57:18 needing 66:10 neighborhood 60:5 neighboring 45:11 NEPA 11:18,24 13:13 14:2 67:19 nerdy 34:5 network 25:4 74:16 nice 8:12 61:3 Nick 32:2,6 nicknames 72:12 night 52:15 59:19 ninth 46:14 non-science 18:21 North 9:12 Northern 26:12 note 50:3 57:16 71:17 notification 10:5 15:9 NRAO 8:6,7 9:8 42:23 46:13 62:23 63:14,15 NSF 5:24 6:8, 12,20 7:11,13,	null 54:14 number 7:23 9:19 10:13 17:7 27:7 28:2 30:12 43:15 76:2 numbers 18:22 22:20 33:23	<hr/> O <hr/> O'NEIL 4:7 obligation 14:14 observation 76:2 observations 43:3 observatories 39:1 observatory 4:7,16 5:12 7:19 8:1,7,9, 13,18,23,24 9:7,10,12,13, 23,24 12:6 18:1 21:10 23:5,8,17 24:18,22 25:1, 3,7 26:11,19 28:3 34:6,11 38:8,9 39:1,4, 6,24 40:21 41:16 44:23 45:3,12 46:9 53:8,21 54:1,8 57:19 59:6,23 60:1,7 66:17 67:8 68:15,22, 23 69:4,5 71:12,23 75:11,17	<hr/> P <hr/> p.m. 11:7 painting 48:11 Pale 33:5 pamphlet 20:21 Pang 55:2 park 10:17 parks 69:4 part 4:17 9:8 10:1,5,8 11:1 34:23 45:2 49:3 55:16 60:2,22 67:7 75:2,20 participate 14:7 26:10 participating 14:9,12

<p>participation 17:18 parties 10:14, 16 13:16 14:7 partner 21:11 partners 69:4 partnerships 53:6 parts 55:15,17, 18 party 14:9,13 Party's 27:23 passed 61:20 passionate 71:13 Passport 63:9 past 6:7 17:23 27:18 32:20 39:23 43:11 55:9,15 57:1 69:14 path 8:5 33:24 39:13 Paul 39:17 41:18 43:23,24 pay 29:15 paycheck 20:5 71:11 paying 48:11 Peak 9:24 Pearce 5:19 Peggy 70:10 Pendleton 45:11 Pentecost 5:14 17:5,19 19:19 21:20 24:5,8, 10 26:4 29:21, 24 32:2,5 34:13 39:17 42:15 43:23 45:4,7 51:4,8, 11,16,19 53:13 56:9 people 5:15 17:5,7 18:10 22:8,11,20 23:16,17,21,22 26:21 29:17,18 33:18 36:22 37:9 38:10 42:13 43:15,</p>	<p>18,20 44:9,15, 24 49:5 50:7,8 51:1,17 53:2, 11,23 54:5,21 55:18 56:2 57:3,11,14,21 58:5,6,21 59:14,16 60:3, 4,18 61:7 62:5 66:11,19 67:1 69:21 73:4,5 74:17,19 75:10,13 people's 15:13 percent 7:21 9:7 23:12,14 55:19 period 10:6 15:1,12 17:4 62:7 permit 62:17 person 17:19 24:5 51:7,8 56:9 58:15 60:8 66:3,20, 21,22,24 72:9, 19 75:1 personal 57:16 74:10 personnel 76:4 perspective 64:23 66:16 76:15 Pete 32:2,4,19 36:24 38:4 75:7 Petes 34:7 PFC 42:20 Ph.d. 37:18 44:5 55:2 phenomenal 25:15 phenomenon 52:3 phrase 75:14 physical 53:5 physically 40:21 physicist 50:19 physics 18:4 39:22 42:3,19 44:9 56:2 58:23 62:16,18</p>	<p>pick 68:14,16, 20 picture 35:19 piece 13:5 pieces 13:1 pilot 62:21 Pingel 32:2,6 pizza 76:6 place 22:23 28:19 35:1 43:20 49:1 52:2,11 55:1 60:5 67:12 68:3 69:6 74:17 places 22:10 28:6 29:9 49:19,20 51:1 74:4 plan 9:5 20:24 plane 48:20,22 planet 20:17 planning 8:21 plans 9:16 players 52:23 plays 75:20 plug 22:11 Pocahontas 20:1 24:15,17,19,24 25:19,23 26:2, 12 28:17,20 52:3,7 53:20 56:19 57:21 58:1 60:17 62:9,13 67:5 70:12 point 4:18 10:24 13:6 16:18 17:3 28:4 32:13 59:20 75:22 pointed 68:16 pointing 56:16 points 4:14 35:2 68:17 Pokemon 34:3 Policy 11:17 pollution 19:11 pool 69:7,9 poor 57:17</p>	<p>populated 54:24 population 47:15 portfolio 6:7, 20,21 7:9,13 35:6 70:8 position 63:23 positives 44:13 possibilities 73:17 post 65:19 post- 30:8 post-doc 42:20 49:14 post-docs 76:5 postdoctoral 41:19 42:18 44:1 posted 16:24 17:2 potential 11:19 12:1,4 13:17, 22 14:18 52:19 potentially 15:19 35:20 power 22:10,14 61:17,19,20,21 62:1 practical 18:5 preference 66:17 preliminarily 13:3 preliminary 5:3 10:4,9 13:6 prepare 12:3 25:22 preparing 15:5 presence 18:18 presentation 5:7 11:4 16:23 presented 13:4 preservation 13:15,17 15:18 66:9 preserved 52:2 president 26:14 60:13 68:1 President's 8:16,19 9:2</p>
--	--	--	---

pretty 28:4 47:12	promise 19:20	pure 37:24	rain 48:13
previous 9:8,17 68:16	Promised 73:22	purpose 4:21 12:10	raise 38:20
priceless 20:18	promote 53:1	purposes 8:21	Rajwade 29:22, 23,24 31:6,7
pride 19:13 37:2	pronounce 42:15	pursue 20:10	ran 58:7
primary 34:24	propagate 37:12	put 20:15 25:16 27:6 29:9,18 34:17 41:15 51:24 59:21 65:13 68:4	range 13:9 52:19
principal 24:20 25:10	properties 13:19,22,24	property 25:14	rare 28:9 64:24
prior 11:20	proposal 8:22 11:24	proposal's 14:16	rarely 65:6
priorities 16:5	proposed 5:3 10:4,9 11:20 12:4 13:3,18 52:16	putsy 47:9	rash 65:7
private 53:7	prospective 32:22	putting 67:22	rating 23:9,10
privatization 53:3	proud 57:8 71:15	PYTHON 46:12	ratio 20:12
privy 71:5	prove 66:19	<hr/> Q <hr/>	Ray 46:10
problem 61:22	provide 6:1,3 12:23 16:7 50:16 68:9	qualified 50:20 57:7	reach 42:5
problems 60:20	provided 7:20 24:23	quality 13:10 54:11,12 64:23 73:20	read 20:21
proceed 7:11	providing 19:23	quantifiable 68:20	reading 35:17
process 4:17,20 5:6 9:22 10:1, 2 11:1,9,15, 16,22 12:7,9 13:13,21 14:2, 3,4,24 16:19 20:13 37:20	Provinces 28:9	quantified 68:18 69:17,18	ready 17:3
processes 15:17	public 4:5 5:8, 18 11:2 12:8, 11 14:24 15:4, 12 17:3,22 19:23 21:16 26:21 27:14 37:22 38:1,8 39:12 40:5,6, 10 42:3,6 44:17 68:10	quantify 74:23 75:12	reaffirmed 7:9
profession 25:16	published 4:12 5:4 7:7,22 8:5 10:4	Quest 26:15 27:10	real 18:5 19:1 28:17 49:20 50:13 54:2
professional 38:2 39:5,11	pulsar 33:11 34:4,19 38:4,6 43:8,10 55:15, 20 56:1	question 44:20	realigning 20:13
professionals 37:22 39:7 41:11	pulsars 40:15 55:10,20	questions 42:7	realized 19:1 63:3
professor 72:16 75:22	pulse 55:10	quick 74:1	reason 31:10, 12,13 34:24 44:7,12
professors 56:4	pulses 55:11	quickly 9:18	reasons 28:3
profitability 29:10	purchase 25:3	quiet 26:19 28:7 55:12 65:1 66:10	Rebecca 76:11
profits 29:18		quote 7:10	rebuild 29:14
profound 39:24 41:1		<hr/> R <hr/>	rec 69:4
program 5:11 7:15 25:20 34:16 74:3		radiation 65:5	received 6:8 7:17 25:7
programs 25:24 33:10		radio 7:2 8:1 19:5 21:8 23:18 24:22 26:19 31:11 35:22 36:1 50:20,21 55:11,12 62:24 65:9,11,12 66:10	recent 42:2 69:22
project 42:10 62:22 63:8			recognize 45:2 74:19
prominent 28:17			recognizes 71:1

scientists 19:1 21:4 28:23 30:22 38:14 70:7	Seth 27:12 severe 31:21 severely 35:21 37:8 sewage 54:9 Shame 21:4 share 34:1 71:10 sharing 68:22 sheet 13:4 16:15,22 sheets 14:10 Shoemaker 27:12 shop 46:16 shopping 44:16 short 19:20 shorter 7:2 Shostak 27:12 show 69:16 shown 54:1 shows 8:19 33:14 69:16 shut 49:7 55:1 61:9 shutting 35:20 sickness 65:5 side 20:15 sign 41:15 51:9,11,16 75:14 sign-in 14:10 signal 55:16 56:5 signed 15:8 16:11 17:5 significant 13:18 22:1,9, 13 23:15 simple 26:22 65:15 simply 34:11 single 46:11,14 55:10 75:1 single-dish 7:2 35:22 39:6 sir 24:3 sit 33:12 71:5 site 8:7 10:22 19:17 20:11,23 21:15 22:6	28:3 site's 7:21 sites 63:14 sitting 17:15 skills 18:5 39:2,8 50:21 Skynet 18:8 72:17 sledge 65:22 slept 65:5 slides 9:9 small 20:8 43:5 44:13 smaller 32:8 70:5 soccer 69:2 social 48:1 society 41:11 73:3 socioeconomic 36:21 66:8 68:17 socioeconomics 13:11 solar 18:16 50:19 solicit 52:18 son 47:18 48:5, 7,11 65:9 song 55:7 sort 13:1 14:8 17:17 64:19 65:21 sound 69:1,13, 15 sounds 65:14 sources 9:14 south 21:23 36:11 space 33:4,10 40:5,6,10,15 53:5 63:9 Spain 48:20 spark 29:1 38:11 speak 17:9 21:21,23 24:13 39:19 51:10,19 53:16 58:12, 15,16 64:7,11 71:19 75:3,5,	14 speaker 58:15 64:6,15 68:16 76:10 speakers 68:12 speaking 17:8, 13 44:17 51:18 71:7 73:24 special 29:8 60:22 67:12 specialist 17:22 species 14:15, 17 15:19 specific 6:4 12:20 specifically 46:10 55:21 spend 29:12 61:2 76:5 spending 67:16, 23 spent 24:20 59:4,8 61:2 spoke 30:5 64:12 spoken 53:11 54:5 58:3,4,5 70:13 71:8 spouses 57:6 spread 20:5 spreading 40:7 spring 15:6 squad 60:14 staff 4:6 48:6 59:16,17 63:8 64:1 74:2 staffed 49:6 stage 38:13 staging 22:16 stake 21:18 stand 17:16 65:12 standards 63:11 standpoint 71:14 Star 26:15 27:10 47:19 stars 25:11 58:24
---	---	--	---

start 4:11,23 10:1 34:4	stream 23:7	Sue 62:8	34:17 36:5,9
started 18:2 31:9 32:10 40:3,4 46:4 57:23 71:7 72:10,11	street 76:22	suffers 45:20	37:21 39:3
Starting 7:20	stressful 74:21	suggestions 10:8	40:2,13,14
state 12:24 13:16 25:21 26:17 32:17,24 33:1 40:8 41:3,13,17 42:12,14 43:16 45:11,19 48:19 50:13 54:22,23 63:10 67:15 71:24 75:18	strong 30:24 55:11 57:9	summarized 9:18	42:21 48:17
stated 6:11,24	strongly 37:14 52:15 53:7	summer 25:20 34:16 38:6 55:23 57:18 63:12 74:12	50:5,15 53:17 54:7,11 56:20 57:16 60:24 64:4,18,22 66:7,8 76:13
Statement 4:5 5:6 9:22 10:3 11:14 12:2,14 13:8 15:6,15 16:3,10 34:23	struck 35:18 75:13	sun 50:23	talked 9:9 34:15 37:1 44:3 56:22 62:13 72:16 74:2
statements 12:3	structure 37:24 38:15	supplement 58:7	talking 29:5 35:20
states 21:1 27:19 28:6,8 67:24	struggled 62:20	supplies 60:16	talks 73:15
station 25:13	student 24:14 31:7 32:7 34:16 37:17 38:19 39:12 55:3 74:3,7 75:8	support 6:14 24:14 26:13 47:7 52:15 53:7	target 14:22
stationed 45:17	students 18:7, 14,19,20 19:2, 12 21:3 25:14 28:24 30:7,12, 14,17 31:5,17, 19 32:9,23 33:9,13,14,19, 22 34:3,8 37:19,22 38:2, 5,17,18 39:7 40:8,11,13,16, 18,22 41:4,13, 16 42:6,21 43:1 45:22 46:18,22 55:24 56:6 57:1 63:6 71:3 72:17,20, 21,22 73:20 74:5,12,24 76:5	supporter 22:1	targeting 15:6, 15,24
status 8:14	studied 5:4 52:22	supportive 4:8	taught 60:16
statutory 14:14	studies 48:1	supports 22:24 24:17 74:18	tax 20:22
stay 30:15 37:13 53:8 58:8 76:7	study 44:4 50:22 56:2	supposed 58:24	taxes 29:15
stayed 70:14,18	studying 55:3 65:9	surrounding 71:23	taxpayers 21:1
steerable 21:2 33:2	stuff 33:16 48:18	survey 6:10 7:4,8 35:15	taxpayers' 27:1
STEM 18:6	submit 12:13 16:7,10	suspect 11:15	teach 18:13 46:2,12 47:23 56:19 57:4 62:16
step 10:7 38:13 44:6	submitted 73:1	suspension 10:19	teacher 25:18, 22 47:6 56:19 57:17 62:10,14
stepped 4:7 46:10	successful 75:24 76:9	sustain 7:14	teachers 46:6 57:7 62:21,22, 23 63:11,17 68:24 76:21
steps 13:20		sweet 55:12	teaches 48:8,9
stewards 5:24 6:6		swimming 69:5,7	teaching 25:18 43:5 59:4 62:18 63:21 73:4
stop 24:2 39:3 73:23		symptoms 65:5	team 4:24 40:5, 6,10 50:10 63:13
store 65:19		system 25:8 54:9 57:9	Tech 48:14
storm 22:9		systems 18:16 56:21	technical 23:18,22 38:24 39:8
		<hr/> T <hr/>	technicians 24:24 28:23
		tables 16:11	technologies 27:5
		Taekwondo 69:1	
		tag 16:12	
		takes 31:23 37:2	
		taking 11:9 12:1 19:3 49:13 54:20	
		talented 55:24	
		talk 4:24 5:3,5 23:10 25:17	

technology 10:17 24:15 38:12 41:14 45:24	22,24 41:15 45:9 47:4,24 49:18 50:15,24 55:7 60:6 62:3 66:19 69:17	tool 40:23,24 tools 21:7 top 20:4 31:10 38:2 58:23 65:20,21 total 8:17 24:18 touch 33:10,12, 22 54:3 touched 47:14 touches 33:4 tour 57:19 tourist 28:11 tower 65:2 town 50:9 61:10 76:18 track 14:6 traffic 13:11 trails 49:8,9 train 30:16 50:16 51:1 trained 62:24 63:11 training 30:14 43:1 transcript 16:8 transferring 62:13 transformative 17:24 18:24 transition 53:5 translated 32:12 Transportation 24:15 tree 61:8 tremendous 63:3,7 71:4 trickled 63:6 trip 46:14 56:23 trips 45:14 truck 28:7 trucks 60:20 true 18:6 turn 11:3 two-way 33:8 type 25:24 28:10,22	types 18:15 36:24 50:11 <hr/> U <hr/> U.S. 7:14 14:18 21:8 36:1,14, 18 unacceptable 37:5 unattainable 70:4 uncanny 33:6 uncertain 73:7 uncles 53:24 undergraduate 39:20 undergraduates 30:9 42:23 understand 4:15 20:21 41:5 52:20 61:1,4 68:9 75:12 76:15 understandable 40:12 understanding 38:7 understands 71:22 unfamiliar 11:15 UNIDENTIFIED 45:6 51:5,6,9, 12,17 53:10 56:11,14,17 58:2,13,14,17, 18 61:12,13 64:6,9,10,12, 14,20 68:12 73:22 75:5 76:10 unique 34:11 52:3 53:19 67:6,7 70:6 United 21:1 27:19 28:6 67:23 universal 33:6 universe 35:11 47:23
telescope 6:24 7:2,24 8:3 18:8,11 30:20, 22,24 31:13 32:15 33:2,7, 9,12,14 34:24 38:23 41:22 42:4,11,12 43:14 44:14 45:2 49:2 50:9 55:8 59:6,23 60:1 61:3,6 72:8,10,13,17 73:14,16,17 74:6,9 75:11	thinking 42:6 thought 19:21 21:10 52:10 65:7,8 70:15 thousand 34:7 thousands 38:10 55:17 72:24 threatened 14:17 three-tier 37:20 thrive 53:8 tied 75:23 timbering 28:21 time 8:2 11:10 17:10,11,14 19:23 23:24 24:3,22 30:6, 22 34:15 35:21 36:2,15,16,23 37:6 38:6 43:6 46:12 49:13 52:14 58:7,22 59:7,11 62:23 63:15 66:4 67:4 75:3,8, 22,23 times 4:11 15:14 74:22 tiny 54:22 65:24 titled 6:10,22 today 4:19,22 5:2,13,15 9:14 10:1,12,24 12:13 14:15 15:4,8 16:8,10 17:8 19:21 20:5 30:4,8,12 34:17 36:23 49:15 74:11 told 65:4 tomorrow 71:17 tonight 45:9 71:4 75:13,14, 20		
telescopes 6:2, 16 9:20 19:8, 17 35:22 54:12			
temporary 62:12			
ten 24:20 25:2 46:20 65:23 74:7			
tend 64:4			
tens 38:9 72:24			
tenth 67:5			
term 63:23			
terms 35:19 36:15 37:1			
terrible 57:13			
terrified 76:24			
testimony 26:16			
therapist 47:10			
thing 25:10 26:23 27:6 28:10,20,22 35:17 37:3 45:12 46:2 47:20,21 48:17 50:12 53:4 60:18 62:18 72:2,11 74:14			
things 4:12,17 8:15 17:17 20:1 22:12 23:4,9,19,20 27:9 29:7,11 36:24 39:22 40:14,15,17,			

universities 8:8 55:22 73:5	54:17 55:6 58:21 62:22,23 63:11,22 66:23 70:12 71:1,9, 14,24 76:7	ways 68:18 weak 55:11 website 15:10 16:16,20 week 46:11 weeks 25:22 30:16 38:5 weight 49:17 welcoming 57:20 wellness 69:11 West 9:11 19:14 30:2 31:1,5,8 32:20,23 37:17,23 38:13,18,20 39:14,20 40:5, 9,11 41:2,17, 20 42:8,9,12, 18,20 43:12, 15,16 44:1,4, 7,15,21 45:10, 15,20,22 48:15,16,24 52:4 53:22 54:16 55:6 58:21 62:22,23 63:11,22 70:11 71:1,9,14,24 76:7	words 32:21 55:12,13 work 17:21 23:17 26:18,20 28:5 29:11 33:10 36:13 38:3 42:8,14 44:4,10 47:10, 11 48:13 49:22 50:7,10 56:5 57:6 62:11 67:9,10 68:15 70:11 74:17 75:2 worked 17:23 18:7 55:24 57:18 59:13 76:22 working 18:2 43:7,10 55:9 57:22,24 59:19 74:20 works 14:3 48:9,20 60:20 76:19 Workshop 62:21 workshops 73:2, 4 world 21:3,4,7 36:17 39:1,8 44:3 45:1 52:5,6 55:21 64:24 66:11 72:14 74:4 world's 7:1 Worlds 6:10 worldwide 54:21 61:6 worried 72:18 76:23 worry 70:20 76:21 worth 29:11 Wow 48:18 wrap 17:17 write 55:19 writing 52:1 53:17 written 11:2 12:13 16:10,11 wrong 61:8 65:7
university 9:11 25:21 30:3 31:8,23 32:23 37:17,19 38:17,19,20 39:21 41:20 42:9,12,18,20 43:11,16 44:1, 5,8 45:15 58:21,22 62:21 63:10 71:9	visit 28:15 visited 28:15 vital 60:17 vitality 7:14 69:23 VLA 36:6 voice 44:2 72:6 76:13 voices 11:8 void 54:14 volunteer 68:21,23,24 volunteered 46:7 volunteers 46:11		
university's 42:9			
unrivaed 50:10			
upgrade 25:6			
urge 28:1 34:10 37:14 39:15 60:8			
USA 71:24			
user 34:18			
users 52:19 69:22			
<hr/> V <hr/>	<hr/> W <hr/>		
Vance 58:20 72:8	wait 15:21 walk 11:14 27:11 67:18 74:14 walking 20:24 44:16 49:8 wanted 14:14 15:2 19:3 28:15 31:10 42:21 43:9 44:2,7 45:9 46:2 50:15 58:12 59:8 70:19 75:3,9, 15 warm 22:21 Washington 70:16 waste 52:14 water 23:5,6,8, 14 54:16 57:15 wave 35:11 wavelengths 7:2 waves 9:13 35:10 41:19 42:1,2	wetlands 25:12 widely 53:9 wider 37:7 widest 52:18 wife 28:16 Wildlife 14:19 Williamson 17:20,21,23 40:4 72:15,16 Wilson 39:17,18 wintertime 22:14 wired 25:1 wireless 25:5 Wisconsin 67:10 wise 61:1 woman 58:19 won 54:9 wonderful 53:3 wondering 67:15 word 40:7	
Verber 60:12 61:14 76:17			
vein 35:1			
verbal 16:7			
verge 35:9 36:2			
version 33:18			
versus 29:5			
viable 12:17			
Virginia 9:11 19:14 30:2 31:2,5,8 32:20,23 37:17,23 38:13,18,20 39:14,20 40:5, 9,11 41:2,17, 20 42:8,9,12, 13,18,20 43:12,16,17 44:1,4,7,16,21 45:10,15,20,23 48:14,15,16,24 52:4 53:22			

wrote 18:23
WVU 18:13 30:3,
9 31:9,19 32:7
40:3 55:3 71:3
72:16,21 75:8,
22 76:1
www.nsf.gov/ast
16:20

Y

year 7:6,20
8:15,19,20,24
9:1,2,4 27:24
28:8 29:16
30:16 39:9
43:11 44:5
46:14,19,22
48:9 55:9
59:4,22 60:16
69:16 73:1

years 7:18
17:24 21:11
24:20 26:18
28:12 30:3,6
31:14 32:20
35:8 38:12
39:5 40:1
45:17 46:4
56:24 57:2,4,
17 59:9 60:16
62:20 63:21
69:14 74:7
75:24 76:3,23

yoga 69:1
young 58:18
youngest 25:17

Z

zone 21:8 22:4
26:19 55:12
65:1 66:10
zones 28:7
Zumba 69:1