

GOODMAN RESEARCH GROUP, INC.
Program Evaluation • Consultation • Market Research

StarTalk Radio Summative Evaluation

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TABLE OF CONTENTS

Introduction.....	1
GRG’s Evaluation of StarTalk Radio.....	1
Methods	3
Measures and Participants	3
Results.....	4
Analysis Plan.....	4
Profile of Participants.....	4
Listeners’ Reactions to StarTalk Radio.....	11
StarTalk’s Effects on Current and Prospective Behaviors	18
Best Practices to Develop and Support a Radio Show about Science.....	19
Conclusions.....	24
Recommendations.....	25
References.....	27
List of Appendices.....	28
Appendix A: Annotated StarTalk Listener Study Surveys.....	28



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INTRODUCTION

Curved Light Productions and Principal Investigator Neil deGrasse Tyson received an award for a grant from The National Science Foundation (DRL-1010754) to create StarTalk Radio (StarTalk) with Neil deGrasse Tyson. StarTalk is a commercial radio program that aims to bridge the intersection between popular culture and science education. The multimedia project delivers content through various formats including commercial radio programs, podcasts, videos, and live venue shows. Hosted by Neil deGrasse Tyson, each episode or show combines comedy, references to pop culture, and public fascination with space science to reach audiences potentially new to the informal science field.

GRG'S EVALUATION OF STARTALK RADIO

Goodman Research Group, Inc. (GRG), a Cambridge-based research firm specializing in the evaluation of educational programs, conducted the summative evaluation of StarTalk. The overall focus was to examine how well the joint presentation of science and humor reaches a public audience, including an audience not typically exposed to informal science learning, and how well it engages and informs them, such that they are motivated to continue learning more.

Primary evaluation research questions included:

1. To what extent does exposure to StarTalk lead to increased interest in and knowledge of space science topics?
2. To what extent does StarTalk motivate users to pursue additional and related learning activities?
3. To what extent does StarTalk reach an audience that is new to informal science learning?
4. What best practices can be shared regarding effective ways to develop and support a radio show about science?

To address these research questions, GRG conducted the following evaluation activities:

- Developed a survey for the StarTalk team to distribute at Live Venue Performances; StarTalk reviewed the data internally
- Large-Scale National User Survey
- National Listener Study
- In-Depth Review of Social Media Use and Activities

GRG conducted the Large Scale User Survey in fall 2012 to assess overall reach and impact. In response to modifications the StarTalk Radio team made to the initial plan, including the addition of different media formats and options for users to access the StarTalk programs, the User Survey was designed to develop a strong understanding of who uses the various StarTalk resources, how they learned about the program, how and where they access the different formats, and what effects the program has on different audiences relative to the ways in which

they access it (i.e., primarily addressed Evaluation Research Question #3, as well as #1 and #2).

Overall, findings showed:

- Most StarTalk users were white men, ranging in age from 18 to 80. One quarter of respondents had completed some college or less, one third had a Bachelor's degree, and nearly one quarter had completed at least some graduate school. Nearly two thirds of respondents were employed full time and yearly household incomes reflected a wide range from less than \$20,000 (13%) to \$100,000 or more (16%).
- Users first learned about StarTalk Radio from a social media page, a Neil deGrasse Tyson appearance, or from a web search (e.g., for "Neil deGrasse Tyson," "astronomy," or "science podcasts").
- StarTalk users were generally online-savvy social information- and entertainment-seekers, with a majority going online more than once a week for news, to visit social networking sites, to search for information about topics of interest to them, and to watch video clips and listen to podcasts.
- The large majority had prior experience with the StarTalk podcasts, website, and social media pages. Facebook, Twitter, and iTunes were the top three ways they followed StarTalk. Very few had heard StarTalk on commercial radio.
 - Users listened to the podcasts, via iTunes or the website, at least once a week. Nearly all (90% or more) considered StarTalk podcasts to be more interesting, informative, engaging, and entertaining than other podcasts. Most had already recommended the podcasts to others in person and over social media.
 - Users read StarTalk related posts once a week or more, and they shared posts or images directly with others and on their own pages up to a few times a month.
 - Users considered StarTalk quite effective at combining science and humor, presenting science content that is easy to understand, and increasing their own interest in science and related current events.

Reports of these findings were submitted in November 2012 and July 2013. The July report included findings and recommendations related to best practices for using social media as a way to reach a larger and more varied audience for this and other related programs.

GRG conducted the National Listener Study in summer 2013, and reviewed the Google Analytics and Podtrac data on StarTalk use over the course of the summative evaluation. This report includes findings from the Listener Study along with a list of best practices for using social media, including suggestions for StarTalk to expand the reach of these resources as well as suggestions for other similar programs based on successes and lessons learned from StarTalk.

METHODS

National Listener Study

GRG designed and conducted a pre-post national study to examine how StarTalk programs, as broadcasted on-air on commercial radio, influence listeners' knowledge, interest, and motivation to seek out further information.

MEASURES AND PARTICIPANTS

GRG worked with an external market research company (SSI: Survey Sampling International) to conduct the national participant recruitment. The goal was to recruit 120 adults, ages 18 years and older, to listen to three or four StarTalk Radio episodes, in their on-air radio format¹, and complete two online surveys, one before listening to the episodes and one after.

The surveys were designed to collect data about the following, before listening:

- Background information about participants' radio-listening and information-seeking habits
- Familiarity with StarTalk Radio
- Interest in science and knowledge about various topics

And after listening, participants' reactions to StarTalk including:

- Listening behaviors
- Interest
- Content knowledge acquired
- Motivation to listen further and seek out more similar information
- Perceived effectiveness of the programs

GRG developed and programmed an online pre-survey and post-survey, and created a link with the MP3 files for four two-hour StarTalk Radio episodes that were selected by the StarTalk team. Beginning in April 2013, 250 people qualified and expressed interest in the study. After three months, N=134 participants completed the full study.

See Appendix A for the pre and post surveys with participant data filled in.

¹ The on-air radio format differs from the podcast format that we examined and reported on in earlier reports. The on-air format contains different and more frequent commercial breaks and different music throughout the program.

RESULTS

In this section, we present details about study participants, including their typical radio listening behaviors, their typical engagement with and interest in learning about science-related topics, and where they turn for such information. This information is particular to the sample for this study, and does not necessarily reflect the typical StarTalk user. In addition, we describe the findings related to the following:

- Listeners' reactions to the program including their listening behavior and feedback about the experience
- The extent to which listeners perceived that the StarTalk episodes increased their knowledge and interest in the episodes' topics and motivated them to pursue additional and related learning activities

Throughout this section, we present group differences that are statistically significant and/or meaningful in the context of addressing ways that different audience groups responded to StarTalk. Findings aim to demonstrate how effectively StarTalk is reaching different audiences (including those who may be new to informal science learning). Qualitative data are included throughout, in order to support and enhance the quantitative findings.

The final section includes a discussion of lessons learned from the literature and from summative evaluation data and best practices regarding effective ways to develop and support a radio show about science, particularly through use of social media channels.

ANALYSIS PLAN

Subgroup Analyses

The StarTalk Radio team expressed interest in reaching more women and engaging them with the programs and other resources. GRG conducted analyses to compare the survey responses of women and men in order to assess whether women use StarTalk differently and respond differently to the programs. In addition, analyses were conducted to examine group differences by age, education level, annual household income, and pre-existing interest in science. Differences that were revealed at a statistically significant level are highlighted in this report.

PROFILE OF PARTICIPANTS

The StarTalk Radio team was interested in learning more about how different types of listeners respond to the program with respect to appeal, learning, and resulting motivation and behaviors to seek more information. Therefore, GRG conducted the national recruit with a goal of reaching the following demographic coverage:

- **Gender:** About half women and half men
- **Age:** About one third each of 18-34 years, 35-54 years, and 55 years or older
- **Education:** A range of education completed, from high school diploma or equivalent through graduate degree; about half with some college or less and half with college or more
- **Household income:** About half under \$50K and half over \$50K
- **Science interest:** A range of existing interest in science (e.g., low, medium, high interest)

Study participants reflect a range of demographic characteristics.

Participants in the full study represented 36 states with the highest proportions from California (11%), New York (10%) and Ohio (8%). Just over half were women, and the average age was 40 years. Nearly half had completed college or more; a little over half had completed some college, including a 2-year degree, or less. Household income ranged from \$20K or less to \$100K or more. See Table 1 for a breakdown of each of these characteristics.

Table 1
Profile of Participants

	% of Respondents	
Gender	Female	56%
	Male	44%
Age	18-34 years	41%
	35-54 years	36%
	55 years or more	23%
	Average age:	40 years
Race/Ethnicity*	American Indian or Alaska Native	1%
	Asian	8%
	Black or African American	10%
	Native Hawaiian or other Pacific Islander	0%
	Hispanic or Latino	8%
	White	81%
Highest level of education completed	High school diploma or the equivalent	20%
	Some college	26%
	Associate’s degree	10%
	Bachelor’s degree	25%
	Some graduate school	8%
	Master’s degree(s)	8%
	Professional degree(s)	3%
Doctorate degree(s)	1%	
Household income	Less than \$20K	7%
	\$20K-\$49,999	36%
	\$50K-\$74,999	23%
	\$75K-\$99,999	13%
	\$100K or more	20%
	Prefer not to respond	1%

N=134

**Respondents were able to select more than one category for Race/Ethnicity; total percentage exceeds 100.*

Half of the participants (51%) were currently employed full time, 28% were unemployed and 16% were employed part-time. Fewer than one in ten were students at the time of the study.

The vast majority of participants (89%) were Facebook users and had used YouTube (82%). More than half used Twitter (59%) and iTunes (54%). Close to one third used Pinterest (37%) and Google + (34%). Examination of group differences revealed that men more than women tended to use iTunes and YouTube, while women more than men tended to use Pinterest. These discrepancies correspond with the current social media landscape (Duggan & Brenner, 2013) and may be reflected in the patterns of StarTalk use by men and women, as StarTalk has a major presence on those media used more frequently by men (i.e., iTunes; YouTube).

Study participants had little prior familiarity with StarTalk Radio.

About one quarter of the participants had listened to StarTalk Radio in some format before the study began. Examination of group differences revealed that those who had listened more often:

- *Had stronger prior interest in science*
- *Were 18-34 years old*
- *Completed college or more*
- *Had higher annual household income*

Before the study, three quarters of the participants had never listened to StarTalk on commercial radio, podcast, or video. Those who had listened in some format tended to be 18-34 years-old, with a higher baseline interest in science, higher education (college or more), and annual household incomes over \$50,000, relative to their counterparts. Among those who had listened (n=36), most heard about it from a friend, family member, or colleague (n=26) and fewer (n=13) had heard a radio ad or promo.

Analyses revealed that more men learned about the program from a radio promo or ad, and more women learned about it by word of mouth.

Most of those who had listened to StarTalk indicated that the amount of time they spent varied depending upon their interest in the topic or the time they had available. They have listened:

- In their car (n=25),
- At home on the radio² (n=14), or
- On a radio channel on their computer (n=14).

Note: One objective for this study was to learn about reactions to the on-air commercial radio version of the program among listeners who had not already listened to StarTalk podcasts or visited the website or social media pages. The fact that three quarters of the participants had no prior experience with StarTalk programs allowed for an accurate pre-to-post test of responses to the program.

² Radio stations listed included KTLK-AM, Sirius XM radio, and a few FM stations, not identified by city (e.g., 93.2, 94.5, 104.3).

Study participants had engaged with science-related topics in a variety of ways in the past.

At least two-thirds of the participants had spoken about, read, or watched a program on television about a science-related topic within the past three months (see Table 2). Fewer had attended a live science-related event or activity or listened to a science-related story or program on the radio or via podcast within the past year; 25% had never listened to a science-related podcast.

Table 2
Participants' Engagement with Science in the Recent Past

	In the past 3 months
Talked about a current event in the news with a friend or family member	81%
Talked about a current science topic or story with a friend or family member	64%
Watched a science program on TV or DVD	65%
Read a science or technology article or blog (in a magazine, newspaper, or on the web)	64%
Visited a library	57%
Watched a science program online	50%
Listened to a science program on radio or podcast	37%
Attended a local science activity or event	19%

N=134

Participants in the study typically listened to commercial talk radio more frequently than to public/non-commercial talk radio.

Before the study, nearly one-third of the participants reported that they did not listen to podcasts. Those who did listen indicated that they listened to a variety of topics of interest to them, including:

- News related 35%
- Entertainment related 26%
- Food related 21%
- Business related 18%
- Related to my community 10%

Most participants (79%) reported that they typically listened to commercial talk radio stations *twice a week or more*. In contrast, fewer typically listened to public/non-commercial talk radio; 38% listened *twice a week or more* and 30% *never* listened. Topics they typically listened to did not differ greatly between commercial and public radio stations. For instance, about six in ten participants reported that they listened to a wide variety of topics regardless of the format. In contrast, about two thirds listened to news-related programs on commercial radio, compared to just about half of participants listening to news on public radio. See Table 3.

Table 3
 Topics Participants Listened to on Commercial and Public Radio

	Commercial N=125	Public N=93
News related	69%	48%
A wide variety	59%	62%
Specific topics of interest to me	54%	40%
Related to specific programs of interest to me	39%	29%
Entertainment related	38%	29%
Food related	28%	21%
Related to my community	26%	16%
Business related	23%	20%

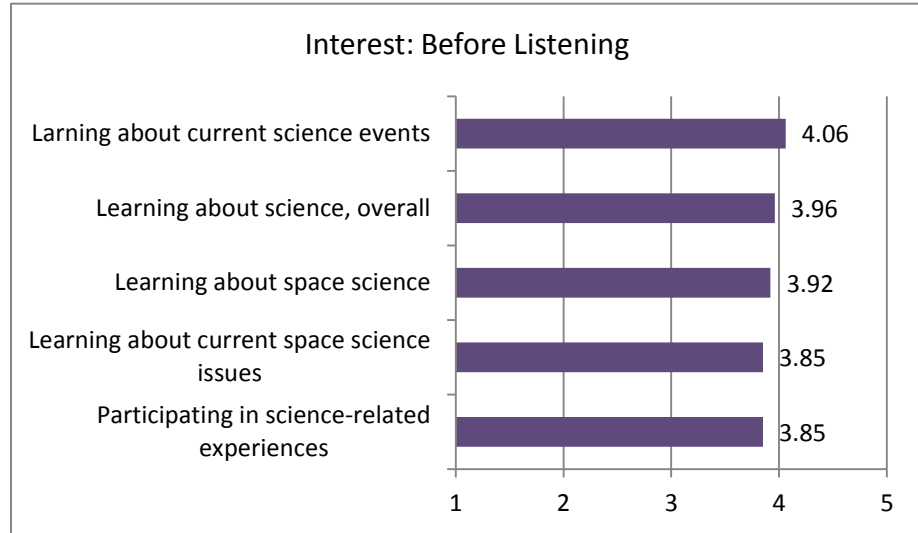
Respondents selected all that apply to describe their listening preferences.

Analyses revealed that men listened to commercial talk radio stations slightly more frequently than did women, whereas women listened slightly more frequently to public talk radio. While this pattern was not statistically significant, it is worthy of note, as the StarTalk Radio team is eager to reach more women through its commercial radio program and related outreach.

Study participants reported some prior interest in science.

Before the study, respondents reported moderate to strong interest in learning about current events in science, and science generally, as well as learning about space science topics and issues, and participating in science-related learning experiences. See Figure 1. A number of participants (43% to 55%) reported that they *occasionally* sought out information about current events in science, science overall, and current space science issues, and nearly as many sought out such information *frequently* (35% to 46%). In order to obtain this science information, they relied most on national news, online searches, online news sources, and science documentaries/programs on television.

Figure 1
 Participants' Interest in Science Learning Before Listening to StarTalk Radio

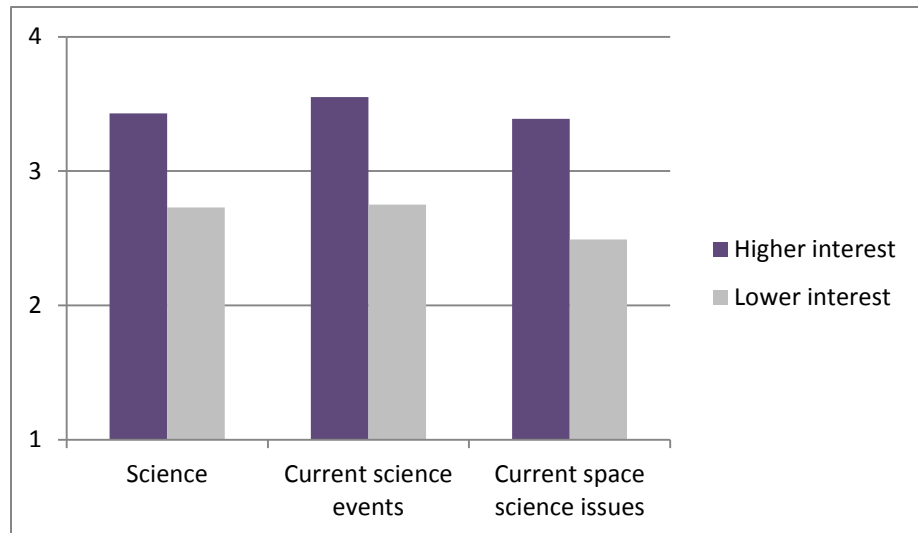


N=134

Scale: 1 (Not at all interested) to 5 (Extremely interested)

On average, participants reported that they *occasionally* sought out current information about science, about current events in science, and about space science. Those who reported stronger interest in science overall sought out this information more frequently. See Figure 2.

Figure 2
 Frequency of Seeking out Science-Related information by Prior Science Interest



N=134

Scale: 1=Almost never, 2=Rarely, 3=Occasionally, 4=Frequently

Examination of group differences revealed that those who were 18-34 years old expressed stronger prior interest than did those who were 55 years and older in:

- Learning about science overall
- Learning about current events in science
- Seeking out more information about current events in science

Those who were 18-54 expressed more interest than did those who were 55 + in:

- Learning about space science
- Learning about current space science issues
- Participating in science-related learning experiences

Additionally:

- Those who completed college or higher expressed more interest in learning and in seeking more information about current events in science.
- Men sought out information about science overall more frequently than did women.
- Those with a household income of \$50,000 or higher sought out information about current space science issues more frequently.

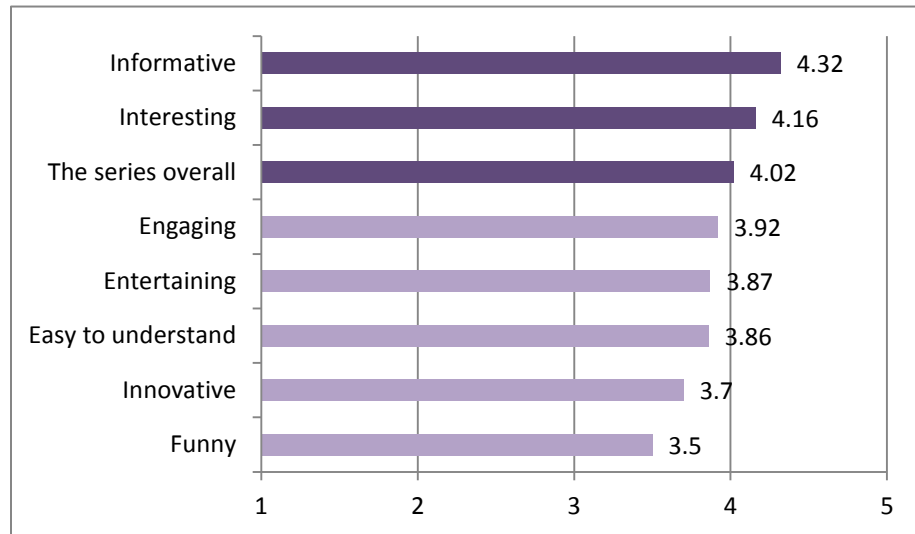
The resources on which participants relied for new information about science were varied. Some demographic differences were revealed in the resources used the most. See Table 4.

Table 4
Resources Participant Groups use for Information about Science

Participant group:	Resources more often used:
Participants with stronger prior interest in science:	<ul style="list-style-type: none"> ▪ Local news broadcast ▪ Science based websites ▪ Science documentaries/ programs on TV
Women:	<ul style="list-style-type: none"> ▪ National newspaper ▪ Public radio talk shows ▪ Public radio news ▪ Magazines
Participants with college or more:	<ul style="list-style-type: none"> ▪ Public radio news ▪ Public radio talk shows ▪ Commercial radio talk shows
Participants with household income over \$50,000:	<ul style="list-style-type: none"> ▪ National newspaper ▪ Public radio news ▪ Public radio talk shows
Participants aged 18-34:	<ul style="list-style-type: none"> ▪ Science based websites ▪ Social networks

Reviews of different characteristics of the program supported the above impressions, with all aspects of the program rated quite positively, on a scale from 1 (*Poor*) to 5 (*Excellent*). As shown in Figure 3, ratings were particularly high for the series overall and the extent to which it was considered informative and interesting.

Figure 3
StarTalk Radio Program Ratings



N=133

Scale: 1 (*Poor*) to 5 (*Excellent*)

StarTalk Radio appeals to a wide range of listeners, and particularly to science enthusiasts.

Analyses of subgroups revealed that while all participants rated the program quite positively, those who reported stronger prior interest in science provided higher ratings than did their counterparts, at a statistically significant level. Overall, StarTalk appeals to a wide range of listeners (i.e., there were no differences by gender, education, age, or income level), and appeals even more so to science enthusiasts.

More than half (55%) of the participants enjoyed the music in the programs and 29% noted that it enhanced their experience, while 24% said the music had no effect on their listening experience. Very few reported they did not enjoy the music (8%) or that the music distracted them from the content (6%). Regarding the type of music they would prefer to hear throughout the program, most noted that the music “*chosen for the show was fine*” and was “*very appropriate.*”

The music was great. A lot of classic rock fitted with the program well, even a little Madonna was thrown in with Lucky Star. I thought that was awesome. Don't change the music. It's perfect the way it is.

Other suggestions, each made by close to one in ten participants, included:

- Any music would be fine (14%)
- Light, mellow, relaxing music (9%)
- Modern, rock music (8%)
- Classical music (6%)

While it was different from what they expected to hear on commercial radio, most participants agreed they would like to hear more shows like StarTalk on commercial radio.

Two thirds (66%) of participants reported that StarTalk was different from what they would expect to hear on commercial radio and 65% agreed they were surprised to learn that the program was on commercial radio. The majority (82%) agreed that they would like to hear more shows like StarTalk on commercial radio and that this type of program does belong in that genre.

After listening to StarTalk for this study, nearly half (46%) of participants recommended the series to friends, family, or colleagues. An additional 26% planned to do so in the future.

Participants primarily listened to the full StarTalk episodes and were not distracted by the commercial interruptions. Few expressed interest in submitting a question about the programs' topics.

For the most part, when they listened to a StarTalk program, participants listened to the entire episode. The episode with the lowest proportion of listeners was *Salt of the Earth*. Less than three quarters of participants listened to both Parts 1 and 2. The rest of the programs were listened to by nearly the full sample.

Table 5
Episodes Listened to by Participants

	% of participants listened to this episode
Through the Wormhole, Part 1	94%
Through the Wormhole, Part 2	92%
StarTalk Live: The Particle Party Part 1	83%
StarTalk Live: The Particle Party Part 2	81%
Real Science with Bill Maher, Part 1	86%
Real Science with Bill Maher, Part 2	86%
Salt of the Earth, Part 1	70%
Salt of the Earth, Part 2	72%

N=128

Most study participants did not find the commercial interruptions to be disruptive.

The very few who did not listen to an entire episode expressed they were not interested in the topic (n=7), did not have enough time (n=5), or were not interested in the guests. No participants reported that they stopped listening due to commercial interruptions.

Generally, participants were not bothered by the commercials throughout the episodes. If at all, participants described the advertisements as *only a little* (39%) or *somewhat* (25%) disruptive. Two thirds listened to the commercials and others focused their attention on something else, particularly after they realized “*they were repetitive*” and “*all for the same things – I felt I wasn’t missing anything.*”

When broadcast on-air, the StarTalk programs last two hours. Sometimes the first and second hours are about the same topic, often with questions and answers in the second hour, and sometimes the topic for the second hour is different from the first. For this study, the programs were broken into one-hour segments and sent as separate MP3 files (i.e., two MP3 files per episode). Half of the participants listened to the full episode (Parts 1 and 2) in one sitting, and half listened over multiple sittings. Few, about one in 10, reported that they listened only to the first hour or only to the second hour.

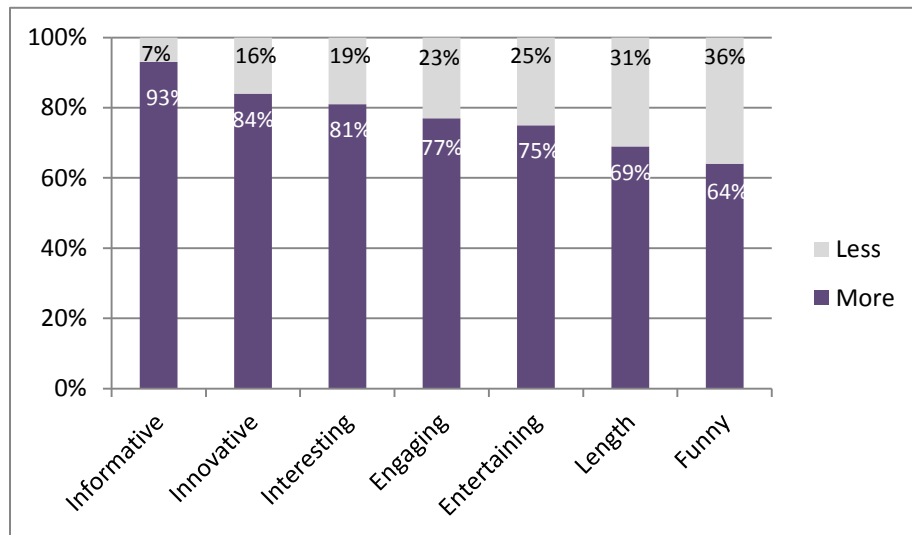
About one third of participants (37%) indicated the format—one topic per one- or two-hour program—was fine, as is; another 37% would prefer multiple topics, all related, discussed throughout the program. Very few (8%) would prefer multiple, unrelated topics discussed throughout the program. There were slight gender differences, with men preferring one topic per program, and women preferring multiple related topics per program.

While listening, only 16% of participants reported they had questions about the topic. They would be more likely to send in a question online than to call in to the show with a question, and overall, listeners were only *a little* or *somewhat* likely to submit a question in either format. Average ratings were 3.33 (likelihood to submit a question) and 2.79 (likelihood to call in), on a scale from 1 (*Not at all likely*) to 5 (*Extremely likely*).

Participants rated StarTalk quite favorably relative to other radio shows with which they were familiar.

Compared to other radio shows to which they have listened, participants rated StarTalk more positively on several characteristics, especially on the extent to which it was informative, innovative, and interesting. See Figure 4.

Figure 4
Perceptions of StarTalk Relative to Other Radio Shows



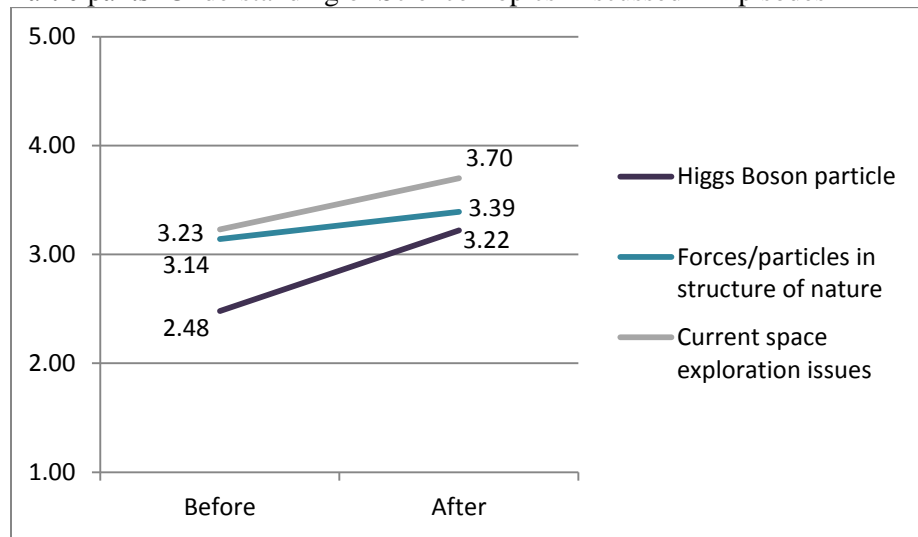
N=134

Two thirds of participants reported that StarTalk *very* or *extremely* effectively combined science and humor and maintained their interest throughout the program. Average ratings were 3.91 on a scale from 1 (*Not at all effective*) to 5 (*Extremely effective*) for both items.

Participants reported increased understanding of the topics covered in the StarTalk programs, particularly those on the *Particle Party* episode.

After listening, participants reported that they understood the topics covered in the programs more than they did before listening. In particular, topics presented in *StarTalk Live: The Particle Party* and one topic from *Real Science with Bill Maher* revealed statistically significant increases in participants' understanding. Figure 5 shows the average ratings for all topics for which there was a statistically significant increase after listening. Table 6 shows the average ratings of understanding of each topic assessed.

Figure 5
Participants' Understanding of Science Topics Discussed in Episodes



N=134

Table 6
Participants' Understanding of Science Topics Discussed in Episodes

	Before Listening	After Listening
Theories on the creation of life and the universe (<i>Through the Wormhole episode</i>)	3.57	3.64
The discovery of the Higgs Boson particle (<i>Particle Party episode</i>)	2.48	3.22*
Forces and particles that make up the structure of nature (<i>Particle Party episode</i>)	3.14	3.39*
Current issues in space exploration (<i>Bill Maher episode</i>)	3.23	3.70*
Environmental issues/Climate change (<i>Bill Maher episode</i>)	3.50	3.66
Geology (<i>Salt of the Earth episode</i>)	3.13	3.30

N=134

Scale: 1 (Not at all) to 5 (Extremely Well)

* Indicates statistically significant differences

Analyses of subgroups revealed the following statistically significant differences:

- **Interest in science:** Those with stronger prior interest in science understood more about all topics before and after listening. After listening, the group difference for one topic, Environmental issues/Climate change, decreased and was no longer statistically significant; those with lower prior interest learned more about the topic and caught up to their counterparts.
- **Education:** Before listening, those who completed college or higher understood more about forces and particles that make up the structure of nature, environmental issues, and geology. There were no differences between education groups after listening.
- **Age:** Before listening, 18-34 year olds understood more about forces and particles that make up the structure of nature, and geology, than did those who were 55 and older. There were no age differences after listening.
- **Gender:** No gender differences before or after listening.

Generally, listening to the programs increased participants' understanding to a point where perceived understanding was relatively equal for all participant groups after listening, even when group differences existed before listening.

Overall, participants felt they had learned *very much* about science, space science, and related current events. Average ratings of how much participants learned from listening to StarTalk episodes are shown in Table 7.

Listening to StarTalk increased participants' understanding to a point where perceived understanding was relatively equal for all participant groups after listening, even when group differences existed before listening.

Table 7
Participants' Perceived Learning from Listening to StarTalk Episodes

	Average rating Scale: 1-5
Science in general	3.66
Science-related current events	3.84
Space science	3.84
The universe	3.84

N=132

Scale: 1=Not at all, 2=A little, 3=Somewhat, 4=Very much, 5=Quite a bit

Analyses revealed significantly higher ratings among those with stronger prior interest in science, and no differences by age, gender, education, or income.

Beyond increased understanding of topics, participants believed the episodes effectively presented content in a way that was easy to understand, informative, and engaging.

After listening, the majority of respondents (over two thirds for each outcome) reported that StarTalk effectively presented content in a way that was easy to understand, raised their awareness of current and ongoing science research, and increased their knowledge about and interest in science and space science, as shown in Table 8.

Table 8
Perceived Effectiveness of StarTalk at Achieving Outcomes

	Average rating Scale: 1-5
Presenting science content in a way that is easy to understand	4.06
Increasing your awareness of current and ongoing science research	4.01
Increasing your knowledge about science	3.96
Increasing your knowledge of space science	3.92
Increasing your interest in science	3.90

N=134

Scale: 1=Not at all effective to 5=Extremely effective

Analyses revealed significantly higher ratings among those with stronger prior interest in science, and no differences by age, gender, education, or income.

STARTALK'S EFFECTS ON CURRENT AND PROSPECTIVE BEHAVIORS

After listening, participants felt motivated to listen to more StarTalk episodes and seek out more science-related experiences.

Participants believed StarTalk effectively increased their motivation to learn more about current events in science. See Table 9.

Table 9
Perceived Effectiveness in Motivation to Seek out Further Information

	Average Rating Scale: 1-5
Increasing your motivation to learn more about current events in science	3.90
Motivating you to listen to more episodes	3.83
Increasing the extent to which you seek out science-related learning experiences	3.62

N=134

Scale: 1=Not at all effective to 5=Extremely effective

Within one to two weeks after listening, half of the participants had already noticed stories in the news about science, discussed science-related issues with others, and watched a television program related to science. One third of participants reported plans to seek out more science-related information via books, podcasts, the web, and on the radio. See Table 10.

Table 10
Participants' Current and Planned Science-Related Actions

	Yes	Not yet, but I plan to	No, and don't plan to
Noticed stories in the news about science	52%	20%	28%
Discussed science issues with friends, family, or colleagues	49%	25%	26%
Watched a television program related to science	42%	30%	28%
Visited a website to learn about science	27%	33%	40%
Searched to other science-related podcasts.	18%	33%	49%
Read a book about science	17%	39%	44%
Looked for additional science shows on non-commercial radio	17%	33%	49%
Visited a museum or science center	12%	52%	36%
Attended a science-related lecture or presentation	11%	29%	60%

N=132

Additionally, after listening, four in ten (41%) visited the StarTalk Radio website, and another 40% planned to do so. Approximately one third planned to “like” StarTalk Radio on Facebook and to follow @STARTALKRADIO on Twitter (see Table 11).

Table 11
Participants’ Current and Planned Social Media Activity

	Yes	Not yet, but I plan to	No, and don’t plan to
Visited the <i>StarTalk Radio</i> website	41%	40%	19%
“Liked” <i>StarTalk Radio</i> on Facebook	15%	37%	47%
Followed @STARTALKRADIO on Twitter	10%	29%	62%
Shared materials from the website with your social network (Facebook, Twitter, etc.)	12%	25%	63%

N=132

Most of those who visited the website (n=55) had done so *once* (11 out of 55) or *two to three times* (27 out of 55) in the past month. They primarily visited the website to find out more about StarTalk (40 out of 55). About half (n=25) wanted to find more information about Neil deGrasse Tyson, to listen to more episodes, or to find out when and where they could find the program on the radio.

BEST PRACTICES TO DEVELOP AND SUPPORT A RADIO SHOW ABOUT SCIENCE

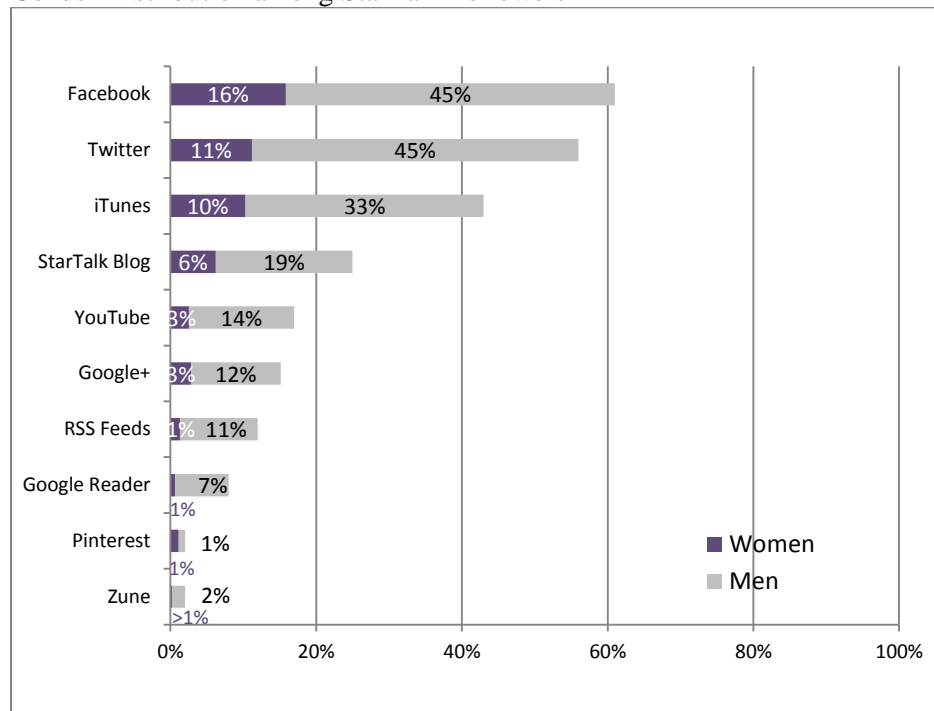
Social media presents an opportunity for members of the informal science community to reach new audiences, and engage current ones. It provides a means to share new resources, interviews, and interesting articles with an audience in an informal setting. Many users see the StarTalk Radio social media pages as a key way to stay updated on new shows and current science articles and trends. However, an untapped opportunity to inform users about science content remains: StarTalk social media followers self-reported that they learned more about space science and current issues than did non-social media followers (GRG, July 2013). This discrepancy suggests that social media serves to complement and enhance the content learning that occurs via the episodes. The topics explained in the StarTalk episodes are supported through the social media posts and links. Through strategic use of social media, the overall impact of StarTalk, and other related informal science resources, can be strengthened.

As a flexible and informal medium, social media content appeals to those with on-demand learning styles, those who wish to keep up to date on current topics and events, those who like to discuss topics with others, and those who wish to share content with others. Additionally, through use of social media, StarTalk can gain benefits such as brand recognition, the cultivation of an online community,

repeated exposure within that community, a reputation as an authority of knowledge, and increased website and podcast traffic (Chandler, 2013).

Finally, women represent a particular population that StarTalk can attract and maintain as a regular audience through use of social media. StarTalk lacks women as a substantial audience base, with a user demographic that is only 23% female. This discrepancy is reflected in StarTalk’s social media user base, shown in Figure 6. The bulk of StarTalk’s social media supporters follow StarTalk on Facebook and Twitter: 61% are StarTalk Facebook followers, and 56% are StarTalk Twitter followers. However, there is an unequal distribution of male and female followers on StarTalk’s social media platforms.

Figure 6
Gender Distribution among StarTalk Followers



N=432, from National User Survey (GRG, 2012)

Yet, women are highly active users of social media websites in general: the majority of users of both Twitter and Facebook are women, accounting for 62% of all Twitter users and 58% of all Facebook users. Women are also responsible for the majority of content shared on Facebook, and, on average, they have 8% more friends than do men (Internet Service Providers, 2013). Women are about five times more likely to be on Pinterest than men (Duggan & Brenner, 2013). Thus, an opportunity exists for StarTalk to use social media as a tool to reach more women and engage them in programs and resources.

Table 12 outlines categories that have been described and cited in the literature as best practices in social media. The first column of the table lists each of these categories. In the second column, successful strategies within those categories are explained and the third column highlights StarTalk’s current activities that meet,

achieve, and reflect those strategies; in some cases, the second column shows an area where StarTalk has an opportunity to accomplish a particular strategy. The information in that column was culled from StarTalk’s social media data and from GRG’s National User Survey. In the final column, GRG shares specific evaluator recommendations tailored to StarTalk’s goals. While the recommendations are specifically for StarTalk, all of them can be helpful to other similar programs, with a goal of using social media to disseminate informal STEM content.

Table 12
Social Media Best Practices

Category	Successful Strategies	StarTalk Activities and Practices	Evaluator Recommendations
Gaining and keeping followers	Keep good company: By surrounding yourself with a network of relevant players and people who value your work, an opportunity presents itself to become an influencer in your community of learning (Martin, 2013).	StarTalk follows and is followed by key players on Facebook and Twitter, including Curiosity Rover, Discover Magazine, Bill Nye and Adam Savage; StarTalk likes Facebook pages such as NASA. StarTalk has 77,500+ Facebook likes and 38,800+ followers on Twitter.	Continue to follow and regularly engage with like-minded people in the industry.
	Share frequently: Consistent sharing behavior ensures that followers always see a fresh and steady flow of content (Martin, 2013).	StarTalk shares frequently on Facebook and Twitter, with regular postings multiple times per day.	Continue to share frequently and include varied and highly engaging content on topics such as space, science, and pop culture (these topics proved to be the most viral on Facebook in 2012-13).
	Provide education and information: Allows content creators to become known as authorities on their topic of specialty (Martin, 2013).	StarTalk posts on subjects in astronomy such as space travel, comets, and shuttle launches. StarTalk users describe StarTalk as educational and informative.	Provide education tailored to a variety of learning styles to ensure different groups of users are reached in a way that is meaningful for them.
	Entertainment value and humor can make a brand feel personable and easily relatable for the audience (Martin, 2013).	56% of StarTalk users described it as entertaining or funny; 10% of StarTalk Radio’s viral Facebook posts were classified as entertaining or funny.	Carry over entertainment value and humor heard in podcasts to social media pages.

	<p>Responsiveness to followers: Helps content creators engage their followers and maintain a dialogue (Martin, 2013).</p>	<p>StarTalk’s Facebook moderators share relevant posts that followers have created. StarTalk’s Twitter page corresponds regularly with its followers by responding in comments.</p>	<p>Continue to respond to followers and increase dialogue. Pose questions for discussion among followers and moderate the discussion to keep it active.</p>
	<p>Offer An Exclusive: People like to feel as though they are part of an inner circle—making an offer only to one’s Twitter network, or offering a first look at something, helps accomplish this (Martin, 2013).</p>	<p>Reflects an opportunity for StarTalk to take action.</p>	<p>With exclusive opportunities such as meet and greets, glances behind the scenes, and open interactivity such as Google hangouts or chatting sessions, StarTalk can bring its followers into their inner circle and engage with them on a more personal level.</p>
Getting shares and virality	<p>Physiological activation: People are more willing to share information with others if they experience high physiological arousal via an emotional stimulus, or an action (e.g., jogging in place) (Berger, 2011).</p>	<p>Followers reported the reasons for sharing content were that they find it interesting (39%), to promote science facts or news to others who may not like science (27%), or because they find it informative (20%).</p>	<p>StarTalk followers share content because it engages their minds; StarTalk may be able to increase shares by engaging their followers’ emotions or bodies as well. For example, StarTalk could help explain a topic by having followers use or move the body in some way (e.g. point at the sky, look in different directions to locate an object outside, and then write about it).</p>
Virality of posts	<p>Post appealing content: Content that is more practically useful, interesting, and surprising has been shown to be more viral (Berger & Milkman, 2011).</p>	<p>89% of Star Talk radio social media followers follow StarTalk because posts are “interesting”; 81% follow because posts are “educational.” The topics most viral on the StarTalk Radio Facebook page were “Space” and “Science.”</p>	<p>Continue to post content that is appealing, based on feedback and followers’ comments and likes.</p>
Reaching out to women	<p>Reach on an individual level: Tweet women back (Sen, 2013).</p>	<p>Reflects an opportunity for StarTalk to take action.</p>	<p>Acknowledge and respond directly to tweets posted by followers, especially women. Post content that is especially interesting to women.</p>

Reaching out to women	Reach out for commentary: Encouraging responses from readers is conducive to maintaining dialogue (Sen, 2013).	Reflects an opportunity for StarTalk to take action.	Use commenting, responses, reviews, hashtags, and sharing features in direct response to women to encourage their continued engagement and participation.
Reaching out to women	Exposure to a larger audience: A major way to reach women is to gain exposure on blogging networks with large female followings (Sen, 2013).	Reflects an opportunity for StarTalk to take action.	Discover and acknowledge bloggers with female followers, and send out podcasts, sample videos, and other content for their review. For example: Jenny Lawson’s “The Bloggess,” Elise Andrew’s “IFLS,” etc.
Self-expression	Online identity formation: Social media users express themselves through user activity: when someone “shares” or “likes” something, they are presenting a part of themselves (Zhao et. al, 2008).	Reflects an opportunity for StarTalk to take action.	StarTalk may further engage its audience by allowing them to express their identity, i.e. through discussions about personal experiences and/or preferences. For example, followers can share a question about space science, or an experience meeting a scientist or seeing Neil deGrasse Tyson at a live event.

CONCLUSIONS

Based on summative evaluation findings and the literature about best practices for using social media to reach and engage audiences, GRG concludes that StarTalk effectively bridges the intersection between popular culture and science education for those who listen and follow the program. StarTalk has a very strong pool of followers who learned about the program via online and social media sources and who listen regularly to the podcasts and visit the website and social media pages. However, fewer followers were aware of or listened to the program on commercial radio broadcasts. Yet, when notified and provided with access to the commercial radio version of the shows (i.e., in this case, links to MP3 files), new StarTalk listeners enjoyed and learned from the programs to the same extent as did typical StarTalk fans and followers.

StarTalk has achieved a formula that combines science and humor, engages the listener, and is perceived as informative, interesting, and entertaining.

Once engaged, regardless of the medium or format, StarTalk listeners reported increased interest in learning more about current science and space science topics and issues. They understood the content presented in the programs, and they expressed interest in listening more, as well as seeking out additional science-related information from other sources.

StarTalk has the potential to reach beyond the well-established fan-base and attract an audience that may be new to informal science learning.

StarTalk users were loyal and committed to the program, listening to podcasts multiple times, visiting the website and social media pages, and sharing information about the program with others. While few were reached by the on-air radio broadcast, those who listened on air responded just as positively to the episodes.

Women responded to StarTalk just as positively as did men. However, they seemed less likely to learn about StarTalk through the media channels where StarTalk is more frequently promoted and played (e.g., iTunes and YouTube). More promotion targeted to women in places where they are accessible (e.g., Pinterest) and more posts, messages, topics, and discussion questions that are posed directly to women may increase their likelihood of learning and telling others about StarTalk. Once exposed to StarTalk, women are likely to remain engaged; this is evidenced by the women in the National Listeners' study enjoying and learning from the content at a level similar to men.

RECOMMENDATIONS

Based on a review of the literature, data collection, and our observations, GRG recommends that StarTalk consider where best to focus efforts going forward. StarTalk enjoys a solid group of fans who follow the programs via the podcasts and online media; far fewer followers listen to the episodes over commercial radio. After this period of distribution over radio and online media channels, StarTalk may wish to consider focusing more solely on those formats that attract the most users, and then work to expand the reach to a wider audience. We recommend the following steps to increase StarTalk's reach via social media:

- Consider previously unexplored ways to engage with followers. For example, StarTalk could engage its followers in a highly interactive format by creating real-time dialogue through “Ask Me Anything” sessions. Such sessions typically exist on social media sites such as Reddit, Facebook, and Twitter. In August 2013, Neil deGrasse Tyson held an “Ask Me Anything” session on Reddit, which consisted of an open, real-time dialogue between Tyson and followers. Followers were able to ask questions about Tyson's new TV series *COSMOS* and receive an immediate response from Tyson himself.
- Consider offering exclusive opportunities to followers, such as meet and greets or behind-the-scenes looks.
- Reach out to women in places where it is known that large female populations exist: social media sites such as Facebook, Twitter, Pinterest, and blogging networks.
- Holding discussions about interests and preferences will allow followers to express their identities, as well as engage in dialogue with each other and StarTalk moderators.

StarTalk has accomplished several social media best practices that may be helpful to similar programs.

GRG recommends that StarTalk continue implementing social media practices that are proving to be successful. These include:

- Following and engaging with other key players in the informal education social media world.
- Engaging with followers by encouraging open dialogue.
- Frequently sharing content that is educational, interesting, and appealing.
- Infusing content with entertainment value and humor.

StarTalk Radio is well-positioned to reach a very wide audience and is likely to maintain a loyal user-base. Increased understanding of the online and social media habits of different demographic groups (e.g., women) can inform promotion and outreach such that untapped audiences are drawn to the program. Once they are engaged, StarTalk listeners tend to seek out multiple experiences

and repeated exposure (i.e., listening to podcasts more than once, visiting the website, following on Facebook and Twitter). They find StarTalk interesting, informative, and entertaining.

GRG recommends that StarTalk seriously consider the media formats that prove to be the most effective for reaching and maintaining followers, and concentrating their outreach efforts accordingly. Summative evaluation demonstrated that few people in the general public, as well as very few StarTalk followers, are aware of and have listened to StarTalk on commercial radio broadcasts. Resources and efforts devoted to outreach to promote the podcasts and social media pages to more followers may prove much more rewarding and worthwhile long term.

The following are ideas for StarTalk to consider in deciding whether a goal is to use social media to drive audience to the commercial radio broadcasts or whether StarTalk will focus efforts primarily or entirely on podcast, web, and social media distribution:

- Rather than increase the amount of content, consider ways to expand the reach to underserved audiences including, but not limited to, women; and utilize and apply the existing content.
- Capitalize on the opportunities inherent in social media to enhance the innovations that go beyond sharing, liking, and posting; for example, expand upon the proposed idea of Cosmic Crusaders as ambassadors.
- Design and conduct enhanced external evaluation around the focus on use of social media, once a full social media campaign is established; for example, look beyond outputs and social media metrics and develop an understanding of how to engage a particular demographic in STEM focused conversations and interactions.

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LIST OF APPENDICES

APPENDIX A: ANNOTATED STARTALK LISTENER STUDY SURVEYS

StarTalk Radio Listener Survey
Pre-Survey
N=134

1. Have you ever listened to StarTalk Radio on commercial radio?

	Percentage
No	73%
Yes	27%

N=134

Experience with StarTalk Radio

2. FOR THOSE WHO HAVE LISTENED TO STARTALK RADIO ON COMMERCIAL RADIO: In general, how often do you listen to StarTalk Radio on commercial radio?

	Percentage
I have listened to StarTalk Radio on the radio once	22%
I listen to StarTalk Radio on the radio occasionally, but not often	45%
I frequently listen to StarTalk Radio on the radio	33%
I almost never miss an episode of StarTalk Radio on the radio	–

N=36

3. FOR THOSE WHO HAVE LISTENED TO STARTALK RADIO ON COMMERCIAL RADIO: How did you learn about the StarTalk Radio programs on air in your area? (Check all that apply.)

	Percentage
From a friend, family member, or colleague	72%
Heard a radio ad or promo	36%
Other, please specify	3%

N=36

Note: Percentages exceed 100% because participants were able to select multiple responses.

Other (N=1):

- Someone on Twitter told me about it.

4. FOR THOSE WHO HAVE LISTENED TO STARTALK RADIO ON COMMERCIAL RADIO: Where do you typically listen to the StarTalk Radio shows on commercial radio? (Check all that apply.)

	Percentage
On the radio in my car	71%
On a radio in my house	40%
Online radio channel on my computer	40%
On a radio at work	17%
Online radio on my phone/mobile device (e.g., Radio.com app)	17%

N=35

Note: Percentages exceed 100% because participants were able to select multiple responses.

5. FOR THOSE WHO HAVE LISTENED TO STARTALK RADIO ON COMMERCIAL RADIO: On what channel do you typically listen to StarTalk Radio shows on commercial radio?

Responses (N=32):

• KTLK AM	4
• The Nerdist Channel	2
• iTunes	2
• Wibx	1
• Mm	1
• Am	1
• 93.2	1
• Q FM 94.45	1
• NewsTalk97.1	1
• 98.7	1
• 168, Satellite radio....On a friend's radio	1
• 241	1
• 104.3	1
• 1210	1
• Sirius xm radio	1
• Tune In radio station	1
• The sky	1
• In the home	1
• Any	1
• YouTube channel	1
• Podcast	1
• Don't remember/Not sure	7

6. FOR THOSE WHO HAVE LISTENED TO STARTALK RADIO ON COMMERCIAL RADIO: Select the choices below to indicate all of the ways you have listened to StarTalk on commercial radio. (Check all that apply.)

	Percentage
The amount of time I listen varies, depending on my interest in the topic	67%
The amount of time I listen varies, depending on my time available	42%
I have listened to the full two hour program	39%
I have listened to the first hour only	19%
I have listened to the second hour only	8%
The amount of time I listen varies, depending on other reasons; please explain	3%

N=36

Note: Percentages exceed 100% because participants were able to select multiple responses.

The amount of time I listen varies, depending on other reasons (N=1):

- I do not have satellite Radio. A friend of my daughter's does at her house.

7. Have you ever listened to StarTalk Radio on:

	Yes	No
Video (www.startalkradio.net)	24%	76%
Podcast	20%	80%

N=133

8. FOR THOSE WHO HAVE LISTENED TO STARTALK RADIO PODCASTS: How often do you listen to StarTalk Radio podcasts (i.e., online or on iTunes...)? (Check only one.)

	Percentage
I have never listened to a StarTalk Radio podcast	8%
I have listened to one StarTalk Radio podcast	20%
I listen to StarTalk Radio podcasts occasionally but not often	32%
I frequently listen to StarTalk Radio podcasts	32%
I listen to nearly every StarTalk Radio podcast episode	8%

N=25

Science-Related Interests and Behaviors

9. How interested are you in the following?

	Mean (1-5)	Not at all (1)	A little (2)	Generally (3)	Very (4)	Extremely (5)
Learning about current events in science	4.06	2%	5%	15%	40%	38%
Learning about science, overall	3.96	4%	5%	21%	31%	39%
Learning about space science (e.g., space travel and exploration, Big Bang Theory, astronomy, etc.)	3.92	4%	8%	19%	30%	39%
Learning about current space science issues	3.85	4%	7%	20%	37%	32%
Participating in science-related learning experiences (e.g., science museums, science cafes)	3.85	3%	7%	24%	35%	31%

N=134

10. How often do you seek out current information about the following?

	Mean (1-4)	Almost never (1)	Rarely (2)	Occasionally (3)	Frequently (4)
Current events in science	3.31	3%	8%	43%	46%
Science, overall	3.22	4%	6%	55%	35%
Current space science issues	3.13	5%	14%	47%	35%

N=134

11. Which resources do you rely on the most to learn new information about science?
(Please select up to 3.)

	Percentage
National news broadcast	55%
Online search	50%
An online news source	42%
Science documentaries and programs on television	40%
Local news broadcast	38%
Science-based websites	33%
Magazines	27%
National newspaper	22%
Public radio news	22%
Public radio talk shows (e.g., Science Friday)	19%
Social networks	16%
Regional/local newspaper	14%
Commercial radio talk shows (e.g., StarTalk Radio, Explorations in Science)	12%
Other; please specify	–

N=134

Note: Percentages exceed 100% because participants were able to select multiple responses.

12. How well would you say you understand the following topics, now, BEFORE listening to StarTalk Radio?

I understand...

	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very well (4)	Extremely well (5)
Theories on the creation of life and the universe	3.57	1%	10%	40%	30%	19%
Environmental issues/Climate change	3.50	4%	11%	33%	33%	19%
Current issues in space exploration	3.23	5%	17%	45%	15%	18%
Forces and particles that make up the structure of nature	3.14	5%	23%	39%	21%	12%
Geology	3.13	8%	19%	37%	26%	10%
The discovery of the Higgs Boson particle	2.47	31%	16%	34%	14%	5%

N=134

13. When was the last time you did the following? (Check one per row.)

	Mean (1-5)	Never (1)	More than a year ago (2)	In the past year (3)	In the past 6 months (4)	In the past 3 months (5)
Talked about a current event in the news with a friend or family member	4.66	2%	3%	1%	13%	81%
Talked about a current science topic or story with a friend or family member	4.37	2%	7%	8%	19%	64%
Watched a science program on TV or DVD	4.31	2%	10%	6%	17%	65%
Read a science or technology article or blog (in a magazine, newspaper, or on the web)	4.26	5%	5%	12%	13%	64%
Visited a library	4.07	1%	19%	8%	15%	57%
Watched a science program online (YouTube, Hulu, etc.)	3.81	15%	6%	11%	18%	50%
Attended a local music, art, or drama performance	3.60	8%	19%	12%	27%	34%
Visited a science museum, aquarium, or other science exhibit	3.47	2%	26%	20%	27%	25%
Listened to a science program or story on the radio or on a podcast	3.32	25%	9%	12%	17%	37%
Visited a zoo	3.25	1%	38%	21%	16%	24%
Attended any local science activities or events (e.g., science festivals, science cafes, lectures)	2.85	23%	26%	13%	19%	19%

N=133-134

Typical Online Behaviors

14. What types of podcasts, if any, do you typically listen to? (Check all that apply.)

	Percentage
Specific topics of interest to me	39%
News related	35%
A wide variety	31%
I don't listen to podcasts	28%
Related to specific programs of interest to me	27%
Entertainment related	26%
Food related	21%
Business related	18%
Related to my community	10%
Other; please specify	5%
None of these	4%

N=134

Note: Percentages exceed 100% because participants were able to select multiple responses.

Other (N=6):

- What is a podcast?
- Religious
- Theology or philosophy
- Politics that affect the U.S.
- Politics
- Sports

15. Which of the following have you used? (Check all that apply.)

	Percentage
Facebook	89%
YouTube	82%
Twitter	59%
iTunes	54%
Pinterest	37%
Google +	34%
RSS Feeds	8%
Google Reader	7%
Zune	3%
None of these	2%
Other; please specify	1%

N=134

Note: Percentages exceed 100% because participants were able to select multiple responses.

Other (N=1):

- Skype

Please Tell Us about Yourself

16. Are you currently: (Check all that apply.)

	Percentage
Employed full time	51%
Unemployed	28%
Employed part time	16%
A full time student	6%
Teaching in a field not related to science	2%
Studying in a field not related to science	2%
Working in a field not related to science	2%
A part time student	2%
Studying in a science-related field	1%
Teaching in a science-related field	–
Working in a science-related field	–

N=134

Note: Percentages exceed 100% because participants were able to select multiple responses.

17. In what year were you born?

	Percentage
18-34 years	41%
35-54 years	36%
55 years +	23%

N=134

Average age: 40 years

18. What state do you live in?

	Percentage
California	11%
New York	10%
Ohio	8%
New Jersey	7%
Pennsylvania	7%
Arizona	5%
Florida	5%
Indiana	5%
Texas	5%
North Carolina	3%
Alabama	2%
Arkansas	2%
Colorado	2%
Illinois	2%
Kentucky	2%
Louisiana	2%
Maryland	2%
Massachusetts	2%
Michigan	2%
Missouri	2%
Nevada	2%
New Hampshire	2%
Oklahoma	2%
Tennessee	2%
Virginia	2%
Wisconsin	2%
Connecticut	1%
Georgia	1%
Iowa	1%
Nebraska	1%
New Mexico	1%
Oregon	1%
Rhode Island	1%
South Dakota	1%
Utah	1%
Washington	1%

N=133

Note: Percentages exceed 100% because of rounding.

19. Are you:

	Percentage
Female	56%
Male	44%
Prefer not to respond	–
:	–

N=128

20. What is the highest level of education you have completed? (Check only one.)

	Percentage
High school diploma or the equivalent (GED)	19%
Some college	26%
Associate degree(s)	10%
Bachelor's degree(s)	25%
Some graduate school	8%
Master's degree(s)	8%
Professional degree(s) (e.g., MD, DDS, DVM, LLB, JD, DD)	3%
Doctorate degree(s) (e.g., Ph.D., Ed.D.)	1%
Other; please specify	–
Prefer not to respond	–

N=133

21. Which of the following categories best describe your race/ethnicity? (Check all that apply.)

	Percentage
White	81%
Black or African American	10%
Asian	8%
Hispanic or Latino	8%
American Indian or Alaska Native	1%
Other; please specify	1%
Native Hawaiian or Other Pacific Islander	–
Prefer not to respond	–

N=131

Note: Percentages exceed 100% because participants were able to select multiple responses.

Other (N=1):

- Mixed race

22. What is your yearly household income?

	Percentage
Less than \$20,000	7%
Between \$20,000 and \$49,999	36%
Between \$50,000 and \$74,999	23%
Between \$75,000 and \$99,999	13%
\$100,000 or more	20%
Prefer not to respond	1%

N=133

StarTalk Radio Listener Survey
Post-Survey
N=134

23. Most of the questions on this survey will simply require you to check a box, but, for starters, please take a moment to create a “tag line” or phrase that characterizes your impressions of the StarTalk Radio series. (The tag line can be a word or phrase – positive, neutral, or negative – that clarifies or dramatizes your thoughts about the series):

[*Click here to see a complete list of responses.*](#)

24. Which episodes of StarTalk Radio did you listen to, at least in part?

	Did not listen to this episode	Listened to some, but not all of this episode	Listened to this whole episode	I don't remember if I listened to this episode
Through the Wormhole, Part 1	5%	–	94%	1%
Through the Wormhole, Part 2	5%	2%	92%	1%
Real Science with Bill Maher, Part 1	10%	2%	86%	2%
Real Science with Bill Maher, Part 2	11%	2%	86%	2%
StarTalk Live: The Particle Party Part 1	14%	2%	83%	2%
StarTalk Live: The Particle Party Part 2	15%	3%	81%	2%
Salt of the Earth, Part 2	22%	4%	72%	2%
Salt of the Earth, Part 1	22%	6%	70%	2%

N=125-133

25. Which of the following were reasons you did not listen to the entire show? (Check all that apply.)

	Percentage
Not interested in the topic	5%
Did not have time to listen to the whole episode	3%
Not interested in the guests	2%
Not interested in the host(s)	1%
Other, please describe	1%
The commercial interruptions	–

N=134

Other (N=1):

- Listened when I had time

26. Which of the following describes your listening behavior? (Check all that apply.)

	Percentage
Did all listening for a full episode (Parts 1 and 2) over more than one sitting	53%
Did all listening for a full episode (Parts 1 and 2) in one sitting	50%
Listened to the first hour (Part 1) only	11%
Listened to the second hour (Part 2) only	9%
Other, please describe	2%

N=133

Note: Percentages exceed 100% because participants were able to select multiple responses.

Other (N=2):

- None
- Listened to them all in one sitting

27. Did you have any questions about the topics while listening to any of the episodes?

	Percentage
No	80%
Yes	16%
Not sure	4%

N=133

28. If the live on-air versions of the StarTalk Radio show included a real-time call-in feature for you to ask questions to the hosts, how likely would you be to call with a question?

Mean (1-5)	Not at all likely (1)	Only a little bit likely (2)	Somewhat likely (3)	Very likely (4)	Extremely likely (5)
2.79	17%	27%	31%	12%	13%

N=133

29. How likely would you be to send in a question, online, that could be answered at a later time?

Mean (1-5)	Not at all likely (1)	Only a little bit likely (2)	Somewhat likely (3)	Very likely (4)	Extremely likely (5)
3.33	7%	19%	30%	23%	21%

N=133

30. Please explain your ratings.

	Percentage
General positive comment	55%
Would submit questions online only	21%
General negative comment	12%
Would not submit questions	11%
Would submit questions (unspecified or both online and call-in)	11%
Other	6%
Would submit questions by calling in	5%

N=132

Note: Percentages exceed 100% because participants were able to list multiple responses.

[Click here to see complete list of responses.](#)

31. Considering all of the episodes you listened to, please rate the StarTalk Radio series on the following:

	Mean (1-5)	Poor (1)	Fair (2)	Good (3)	Very good (4)	Excellent (5)
Informative	4.32	–	8%	8%	29%	55%
Interesting	4.16	1%	8%	13%	31%	47%
The series overall	4.02	2%	7%	18%	33%	40%
Engaging	3.92	4%	9%	16%	32%	39%
Entertaining	3.87	2%	8%	23%	33%	34%
Easy to understand	3.86	3%	9%	23%	29%	36%
Innovative	3.70	4%	10%	24%	36%	26%
Funny	3.50	7%	17%	20%	29%	27%

N=131-133

32. What effect did the music have on your listening experience? (Check all that apply.)

	Percentage
The music enhances my experience with the program	29%
The music distracted me from the content	6%
I enjoyed the music	55%
I did not enjoy the music	8%
The music had no effect on my experience	24%
Other, please describe	2%

N=134

Note: Percentages exceed 100% because participants were able to select multiple responses.

Other (N=3):

- I don't recall much music, other than the rap-like intro that I didn't like since I'm not a fan of rap
- The sort of rap music in the beginning I wasn't too crazy about but it didn't distract me from listening to the rest of the show... all else was fine
- None

33. What type of music would you prefer to hear throughout the show?

	Percentage
Do not change the show's current music	39%
No preference	19%
Modern/dance	10%
Light/easy listening	9%
Celestial/science-related	9%
Other	7%
Alternative/rock	6%
Classical	5%
Include a variety of music genres	5%
Do not play music during the show	4%

N=130

Note: Percentages exceed 100% because participants were able to list multiple responses.

[Click here to see a complete list of responses.](#)

Science Topics

34. How well would you say you understand the following topics, now, AFTER listening to StarTalk Radio?

I understand...

	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very well (4)	Extremely well (5)
Current issues in space exploration	3.71	1%	9%	32%	35%	23%
Environmental issues/Climate change	3.66	1%	13%	30%	31%	25%
Theories on the creation of life and the universe	3.64	1%	7%	34%	42%	16%
Forces and particles that make up the structure of nature	3.41	5%	12%	38%	29%	16%
Geology	3.30	4%	16%	43%	21%	16%
The discovery of the Higgs Boson particle	3.22	8%	15%	38%	25%	14%

N=134

Typical Radio Listening Behaviors

35. How often do you listen to commercial talk radio stations? (For example, sports talk shows, or personalities like Rush Limbaugh or Howard Stern.)

	Percentage
Never	5%
Less than once a week	8%
Once a week	8%
Twice a week	18%
Three times a week	22%
Four or more times a week	39%

N=134

36. FOR THOSE WHO HAVE LISTENED TO COMMERCIAL TALK RADIO STATIONS: What topics have you listened to? (Check all that apply.)

	Percentage
News related	69%
A wide variety	59%
Specific topics of interest to me	54%
Related to specific programs of interest to me	39%
Entertainment related	38%
Food related	28%
Related to my community	26%
Business related	23%

N=125

Note: Percentages exceed 100% because participants were able to select multiple responses.

37. How often do you listen to public/non-commercial talk radio (for example, NPR's 'Car Talk' or 'Science Fridays')?

	Percentage
Never	30%
Less than once a week	14%
Once a week	18%
Twice a week	14%
Three times a week	11%
Four or more times a week	13%

N=134

38. FOR THOSE WHO HAVE LISTENED TO PUBLIC/NON-COMMERCIAL TALK RADIO: What topics have you listened to? (Check all that apply.)

	Percentage
A wide variety	62%
Specific topics of interest to me	40%
Related to specific programs of interest to me	29%
News related	48%
Business related	20%
Food related	22%
Entertainment related	29%
Related to my community	16%

N=93

Note: Percentages exceed 100% because participants were able to select multiple responses.

39. How well does StarTalk Radio fit with what you are used to hearing on commercial radio?

	Percentage
StarTalk is different from what I'd expect to hear on commercial radio	67%
StarTalk Radio is similar to the shows I'd expect to hear on commercial radio	33%

N=133

40. Rate your agreement with the following.

	Mean (1-5)	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
StarTalk Radio is the type of show that should be on commercial radio	4.21	1%	5%	11%	37%	46%
I would like to hear more shows like StarTalk Radio on commercial radio	4.20	3%	1%	14%	37%	45%
I was surprised to learn StarTalk Radio was on commercial radio	3.87	3%	9%	23%	28%	37%

N=134

41. Relative to other radio shows you have listened to, how does StarTalk Radio compare on the following characteristics? Please select one from each of the following 7 word pairs.

StarTalk Radio shows are...

	Percentage
Longer	69%
Shorter	31%

N=134

	Percentage
More entertaining	75%
Less entertaining	25%

N=134

	Percentage
More interesting	81%
Less interesting	19%

N=133

	Percentage
More engaging	77%
Less engaging	23%

N=134

	Percentage
More informative	93%
Less informative	7%

N=133

	Percentage
Funnier	64%
Not as funny	36%

N=134

	Percentage
More innovative	84%
Less innovative	16%

N=133

42. How effective was StarTalk Radio at:

	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
Presenting science content in a way that is easy to understand	4.06	2%	5%	13%	46%	34%
Increasing your awareness of current and ongoing science research	4.01	3%	3%	21%	36%	37%
Increasing your knowledge about science	3.96	2%	7%	20%	34%	37%
Increasing your knowledge of space science	3.92	3%	6%	19%	40%	32%
Maintaining your interest throughout the program	3.91	3%	6%	23%	34%	34%
Combining science and humor	3.91	6%	9%	14%	31%	40%
Increasing your interest in science	3.90	5%	7%	17%	33%	38%
Increasing your motivation to learn more about current events in science	3.90	4%	10%	15%	33%	38%
Motivating you to listen to more episodes	3.83	6%	10%	14%	34%	36%
Increasing the extent to which you seek out science-related learning experiences	3.62	7%	10%	27%	28%	28%

N=134

43. Considering all of your StarTalk Radio experiences, how much have you learned about the following?

	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
Science-related current events	3.84	1%	7%	26%	38%	28%
Space science	3.84	1%	7%	26%	38%	28%
The universe	3.84	1%	8%	23%	43%	25%
Science in general	3.66	1%	8%	34%	39%	18%

N=132

44. StarTalk Radio programs focus on one primary topic for the full one or two-hour episode. If it were up to you, what would you prefer for radio programs like StarTalk Radio?

	Percentage
One topic per one or two-hour program, as is	37%
Multiple topics, all related to one another, discussed throughout the program	37%
I don't have a preference	17%
Multiple topics, unrelated to one another, discussed throughout the program	8%
Other suggestion	1%

N=134

Other (N=1):

- I like the first hour the way it is and the Q&A in the second hour but if you're going to have comedians they should really be funnier...

When they air on the radio, StarTalk Radio programs are interrupted by commercial breaks. Please take a moment to think about how the commercial breaks affected your listening experience.

45. How disruptive were the commercials to your listening experience compared to other commercial radio shows?

Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
2.45	20%	39%	25%	9%	7%

N=134

46. When listening to episodes of StarTalk Radio, what did you typically do during commercial breaks? (Check all that apply.)

	Percentage
Listened to the commercials	62%
Focused my attention on something else during the commercials	39%
Left the room during the commercials	11%
Fast-forwarded through the commercials immediately	9%
Other, please describe	4%

N=134

Note: Percentages exceed 100% because participants were able to select multiple responses.

Other (N=5):

- Listened to the commercials the first few times and occasionally throughout until they became VERY repetitious
- I focus my attention on something else after the 2nd episode because the commercials were repetitive and got annoying
- The first couple episodes I listened but after that I usually got something to drink or a sandwich...as the commercials were all for the same things I felt I wasn't missing anything...
- Listened to them at first
- Played a game on Facebook

47. As a result of listening (either during or after listening) to StarTalk Radio, have you:

	No and I don't plan to	Not yet but I plan to	Yes
Visited the StarTalk Radio website	19%	40%	41%
Discussed science issues with friends, family, or colleagues	26%	25%	49%
Noticed stories in the news about science	28%	20%	52%
Recommended the series to friends, family, or colleagues	29%	25%	46%
Watched a television program related to science	28%	30%	42%
Visited a website to learn about science	40%	33%	27%
Visited a museum or science center	36%	52%	12%
Read a book about science	44%	39%	17%
Searched for other science-related podcasts	49%	33%	18%
"Liked" StarTalk Radio on Facebook	47%	38%	15%
Looked for additional science shows on non-commercial radio	49%	33%	18%
Attended a science-related lecture or presentation	60%	29%	11%
Shared materials from the website with your social network (Facebook, Twitter, etc.)	63%	25%	12%
Followed @StartTalkRadio on Twitter	62%	28%	10%

N=131-134

48. FOR THOSE WHO HAVE VISITED THE STARTALK RADIO WEBSITE: In the past month (since May 2013), about how many times have you visited the StarTalk Radio website? (Please select one.)

Mean (1-5)	I have not visited the StarTalk Radio website in the past month (1)	One time (2)	2-3 times (3)	4-5 times (4)	5+ times (5)
3.04	6%	20%	49%	16%	9%

N=55

49. FOR THOSE WHO HAVE VISITED THE STARTALK RADIO WEBSITE: For what reasons did you visit the StarTalk Radio website? (Check all that apply.)

	Percentage
To find more information about StarTalk	76%
To find more information about Neil deGrasse Tyson	51%
To find more information after listening to episode	49%
To listen to more episodes	45%
To find out when/where the shows play on the radio	40%
To find other formats of the show	26%

N=53

Note: Percentages exceed 100% because participants were able to select multiple responses.

Full Text of Open-Ended Responses

- 1. Most of the questions on this survey will simply require you to check a box, but, for starters, please take a moment to create a “tag line” or phrase that characterizes your impressions of the StarTalk Radio series.** (The tag line can be a word or phrase – positive, neutral, or negative – that clarifies or dramatizes your thoughts about the series):

N=115

- A science based talk show with a twist of humor
- Amazed how much I loved this radio series
- Amazing
- Amazing and informational
- Awesome
- Bill Maher interview!!! Loved it
- Boring
- Celebrity and Science
- Celestial
- Cool
- Decent, but not great
- DIFFERENT COMPLICATED
- Disappointed
- Edgy Science
- Educational
- Engaging
- Engrossing and informative
- Enlightening thoughts about the universe
- Entertaining
- Entertaining, Impressive
- Fascinating listening
- Follow the trends on Star talk radio
- Fun and Educational
- Fun and interesting
- Fun and interesting
- Funformative
- Funny and educational
- Funny and engaging
- Great
- Great and informative.
- Great show!
- Heavens above
- Hit and miss
- Humorous, informative, and entertaining
- I enjoyed the episodes I listened to.

- Informational and fun!
- Informative
- Intellectual but entertaining
- Interesting
- Interesting
- Interesting
- Interesting
- Interesting
- Interesting
- Interesting
- Interesting
- Interesting
- Interesting
- Interesting
- Interesting and enjoyable
- Interesting and entertaining
- Interesting and Quirky
- Interesting and sometimes boring
- Interesting but should be more informative
- Interesting radio show
- Interesting science facts
- Interesting speakers and bad interviewer
- Interesting, but a little boring
- Interesting, but definitely for the intellectual
- Interesting, entertaining and informative.
- Interesting, informative
- Interesting, informative and thought provoking.
- Into the Universe
- Intriguing
- Intriguing
- Intriguingly informative
- It was a bit boring
- Lame
- Makes Science Cool
- Mesmerizingly incomparable
- More entertaining than you'd expect!
- Nerd Lounge
- Neutral
- Nice
- Not bad
- Outrageous Good!
- Positive

- Positive
- Positive
- Positive
- Positive, but it needs better music/format
- Positive, very enjoyable
- Pretty Awesome!
- Real Science = Nature & Science Exploration
- Revealing
- Science
- Science at its finest
- Science Can be Interesting
- Science doesn't have to be dry; a refreshing show
- Science fun talk
- Sometimes interesting, fairly entertaining
- SPACE THINGS I NEVER KNEW
- Stars fun facts
- StarTalk Radio is extensive and informative
- Stellar topics, guests presented with humour
- Straight and Open
- Technical and nerdy
- The new age of science
- Thought provoking, informative series
- Through the Wormhole is a great tagline
- Too far left
- Upbeat
- Upbeat and interesting
- Very amusing and innovative
- Very comedic
- Very entertaining and informative
- Very fun and amazing information
- Very interesting
- Very interesting
- Very interesting
- Very interesting and more so than I thought it would
- Very interesting and thoughtful
- Very scientific
- Where science, space, and entertainment mix
- Witty

[Click here to return to the annotated survey.](#)

8. Please explain your ratings

(Likelihood to submit a question)

N=132

- A rating of aaa. The subjects were very interesting.
- After listening to these episodes I had some questions that I ended up researching the answer for on my own. I know I am always full of questions when something interests me so I know I'll be asking.
- Although I don't have a vast knowledge of science in general I did find the episodes I listened to completely I was surprised to find that I was genuinely interested in the topic. One day I might feel the need to send a question or call in to ask a question.
- always had questions from what I was listening too.
- Awesome host! He is funny and very informative, he knows how to use his words correctly and very educated.
- Berry cool.
- Didn't really enter any ratings so far. I always prefer to do things online if I can so that describes why I would send a question online vs calling in.
- Each episode was very different. One talked more about space and planets, space thing of this nature. The next was the science part and science microbes of the aliens, climate, black holes, religion, politics, and more. It really is a show where you can have fun. I loved the show and I am going to give it an A+. I thank you for being part of this. I would love to be on your mailing list. THANK YOU!
- Feel.
- Found the show kept my attention throughout.
- Fun show we need more educational shows on the radio.
- Funny.
- Great show that makes science accessible.
- I am a big fan of Morgan Freeman and if I had a question would relish the opportunity to ask him a question!
- I am better with written, vice verbal thoughts.
- I am mesmerized by astrophysics and I wish had the intellect of Stephen Hawking and Albert Einstein combined. With astronomy in particular, every new thing I learn always leads to more new questions. It is an insatiable quest for knowledge. Being able to submit questions to Neil deGrasse Tyson is a rare opportunity as he has the extraordinary gift of explaining the complex in ways that enable nearly everyone to understand.
- I am not usually one to call into a radio station. I never have simply because I am driving and the time when I listen to live radio. I would be interested in sending a question in online, much simpler and could do it not while driving. I really liked the Bill Maher interview, wish it was live though instead of prerecorded.
- I could have done without the comedy. I was hoping for more detailed thought provoking information.
- I did have questions while listening to the shows at the time. It's easier to send in a question and have them answer you if they have a chance then to wait online and ask them directly. It's just more convenient to send in a question.
- I didn't even know about the salt uses until I listened to the episodes so I wouldn't have had any questions until maybe after I listened and thought about it. I like science and find it interesting but usually just enjoy listening and won't call in any talk show.
- I don't like to participate in viewer things when I watch things.
- I don't really like calling in, I would prefer to be able to email and get a response via email. Reading responses is easier for me to understand. However, having the host read the email and response on air would be good as well.
- I enjoyed all three episodes that I listened to but felt Morgan Freeman and Bill Mayer a little too one sided. I found the salt episode extremely interesting. I also enjoyed my first two episodes but found the guests a little irritating.
- I enjoyed listening to Star Talk. I'm really not big on Science most of the time. Even though I

would listen to the show. I would probably not call in with a question. I would much rather send in the question.

- I enjoyed the conversation overall. It was funny, intriguing as well as interesting.
- I feel that I personally involve to this episodes.
- I felt thatched topics could have been improved they were a little dry and hard to follow at times.
- I find sending a question online to be more convenient than calling.
- I found it amazing.
- I found it interesting and entertaining and the hosts/guest speakers did a thorough job explaining everything. Some of the topics were beyond my knowledge but I appreciated the learning experience.
- I found many of the episodes interesting and would like to comment.
- I found some of the episodes sum what interrupted because of too much comic relief from the radio hosts which would have a tendency to make me lose my train of thought about what they were talking about in some instances wouldn't give their guest chance enough to explain what they were talking about which I thought was rude not only to the guest what to the sum of the listeners.
- I found this radio series to be very informative. I would be much more comfortable asking questions online rather than calling in.
- I got interested enough in the different topics of the episodes that I might have called in to ask a question or state a fact.
- I have a better chance of catching up with the show after it airs rather than live. I'd really enjoy being able to send in a question and have it answered in the future. Try to listen to the show as my time permits or while I'm doing other activities (running exercise).
- I have always enjoyed anything to do with outer space, Star gazing, and general astrophysics. I don't spend enough time listening, or reading about the topic. This gave a great opportunity to enjoy the topic.
- I have always liked science, but the way that most people, including scientists, talk about it makes it a little boring. I expected this to be some boring podcast of a lecture series where a scientist just talks and talks. I was very surprised when it started out with fun and catchy music and within the first five minutes of the podcasts, several jokes were made. The show was also very informative and I learned many things about science and the universe that I probably would not have learned elsewhere. The host was great and the show really kept me interested.
- I have never called in, or sent it, to a radio station, so I doubt I would for this one. Some of the topics were far more interesting than others.
- I have questions but I feel that I would be nervous to call in and ask them. I would much rather send in the question online. The main problem with submitting an online question is that StarTalk is the type of radio show that I would listen to while driving alone, so submitting an online question would not be possible at that time.
- I knew very little about the universe and this was a really interesting segment for me. Also - the part on salt was even more interesting to me. I must say that I learned a lot while listening to these programs. Fantastic talk show!
- I like the wormhole cause mainly it interested me through the whole thing, taught me things I never new.
- I liked the radio show it was entertaining.
- I love the programs. They were very insightful and thought provoking and really made me think about where we came from, climate change, the death penalty, abortion, assisted suicide and legalization of pot. It also made me think about the Higgs Boson Discovery and I enjoyed listening to all the guest speakers on the show. It also made me think about the universe being alive, the existence of black holes, before the beginning and how we got here.
- I loved listening to the programs. I found them fun and informative. I loved hearing the questions from other listeners and hearing the responses. I honestly wouldn't even begin to know how to phrase a question for the host that wouldn't make me feel really ignorant.
- I need to learn more about the topic.
- I participated in this for the incentive, but found that I really enjoyed the program! I was

expecting it to be way over my head, but I could follow it enough to understand and enjoy each episode. I would be hesitant to call in with a question fearing I would sound a bit 'light', but sending in a question would give me a little more anonymity and confidence. After listening to these episodes, I found more information Neil deGrass Tyson and went to the website. I am surprised at how involved I got into each episode!

- I prefer to interactions online. I would be nervous to be on air.
- I really enjoyed listening to this show. It was smart but humorous at the same time. Also, it was very relaxing to hear.
- I really enjoyed the program, especially the one with Morgan. I would give it 4 stars out 5. Because one episode was rather boring compared to the others.
- I really enjoyed the show especially particle party everyone was so relaxed and positive yet you still learned a lot. I would be more comfortable sending a question that calling in.
- I really enjoyed the speed round where they answered a lot of questions at once. I learned so much! As a dr who fan also I was amused by some of the questions on that particular episode. These shows actually made me want to sit there and listen to them!
- I really liked listening to the show. I would call in if I had any questions. I learned a lot from listening to it.
- I really liked the content that was addressed in the shows. I would really enjoy listening to it more.
- I really liked the show, I learned a few things that I did not know like if a person dies in space or the moon their body never decomposes because space has no microbes. All in all it was def. a positive experience, I find science captivating.
- I really liked the show. It was very interesting, the host were light hearted and seemed to know what they were talking about.
- I really liked this show and a call in or email option to ask a question would be great. I am very interested in science. Additionally I have just recently purchased a telescope and have viewed some very weird stuff that does not make any sense. Also I have noticed over the past two years or so that the Sun has been rising and setting in the wrong place, not just a little off but way off!!!! I have watched quite a few videos on YouTube on these matters and yes I know a lot of these videos are faked and only for entertainment but I have seen a lot of things with my own eyes that are not normal!!!
- I think I would be too nervous to call a show but would be open to asking a questions online if I did not understand an answer or if I wanted more information.
- I think it is easier to do it online
- I think they pretty well answered any questions that I may have had during the show.
- I thoroughly enjoyed these episodes and found each one very interesting. Even though I have a rudimentary knowledge of these topics, I found myself thoroughly immersed in these talks.
- I thought first show with Morgan Freeman was very interesting. Questions on the Q &A sometimes taught me stuff. The speed a ball around the moon that has to go around to catch it. Makes you think.
- I thought that the episodes were a lot more interesting than I expected. I downloaded the episodes onto my MP3 player and would clean house, walk, etc. while listening. I think that if given the chance, I might call in to ask a question but I don't understand a lot of what they were saying, but I did find Morgan Freeman and Bill Maher, and even the host, very entertaining.
- I thought the show was very interesting and educational. The guests on the shows were also interesting. Especially Morgan Freeman. I might call in a question but probably would not submit a question in advance.
- I thought the topics discussed in the episodes were pretty clearly explained and I didn't find myself needing any further research/answers. If I did have a question I probably would not call in to the show because I'm a bit shy. I could, however, see myself asking a question online.
- I wanted to listen more intently then I was concerned about any questions I would have for Mr. DeGrasse or his guests. I wanted to get the feel of the show and what it entailed as I knew I wouldn't be able to participate at that time.
- I was in impressed with the comedians' use of sexual innuendos during Morgan Freeman's part. It just was awful.

- I was rather impressed that the host was as humorous as he was as well as the guests and the caliber of guests. I thought the conversation was very interesting and I would definitely listen again. You should get this program onto Sirius or Pandora.
- I was very bored with the show
- I was very impressed with this show. Great host, great topics, enjoyed the comedy. Loved it all around. Went to iTunes and downloaded other episodes.
- I was very intrigued with the topics of each episode and it broadened my view of Science in General. I really enjoyed Bill Maher's compelling qualities, he's soft spoken and appeals strongly to his audience; captivating almost. When a caller has a question his extensive knowledge of astrophysics is very straight forward and clear & understanding.
- I would be engaged enough by the topics to come up with questions.
- I would be interested in listening weekly if the show were available in my area.
- I would be likely to listen and to maybe call in or ask a question online.
- I would be more inclined to do an online question or email. I would feel intimidated to do a live call in...
- I would be very likely to send a question online. It is a convenient and anonymous way to ask a question.
- I would definitely like to send my questions to the host. I love talk shows and they are so much humorous and help in gaining knowledge.
- I would like it to be a Live, Call-in Format. Maybe once a Month, since it is just Podcast-only now.
- I would like to send in a question online so I don't have to wait to ask a question online.
- I would love to be able to listen to more topics and ask questions through email or online.
- I would love to be able to send questions, it would make it even better for me.
- I would not call in because I am not interested enough in the topic but I might ask a question online because if I did not get an answer I would not really care and it takes much less effort.
- I would not have embarrassed myself by calling in live. I would be more likely to send in a question online so I could sound more intelligent.
- I would probably be more likely to submit a question through email.
- I would probably be too shy to call with questions, but if I really had a burning inquiry it would be easy to send a question.
- I'd rather listen to talk shows than actually participate in them.
- If you're not interested in the subject probably wouldn't listen. I enjoyed Morgan Freeman episode.
- I'm more comfortable sending questions online.
- I'm not comfortable talking to someone on the air and I wouldn't want to be made fun of. I'm not very quick with a comeback. I also don't think I have enough science knowledge to engage in a conversation.
- I'm not one to ask questions, I'd rather research and find answers on my own. I might like to ask some of the guests questions tho if it was a rare opportunity.
- I'm not someone who enjoys calling in to radio stations but I could be persuaded to submit a question online.
- In my opinion it's great idea! I find all that episodes fun and teaching.
- In the one particular episode 'Real Science with Bill Maher, Part 1', Bill Maher talks about how he actually had Carl Sagan as a professor in college. My husband and I are huge fans of Carl Sagan and would have loved to get a little more info about this, so having the ability to be able to call in or ask questions would be fantastic. My husband wasn't even interested in the radio show until he heard Carl Sagan being mentioned.
- It is much more convenient to send in a question online.
- It was a little complicated at times for me as I haven't listened to this kind of series in a very long time.
- It was a pleasant experience and I really enjoyed.
- It was better than I expected. I did like how they answered questions that were sent in. There

were some interesting topics and a few that weren't so interesting. It's a great overall program.

- It was fun to listen to and the guest stars were interesting.
- It was informative, entertaining and interesting.
- It was interesting for sure.
- It was interesting, but had way too many commercials. I liked the guests. I would not submit any questions because I'm not a die-hard science person.
- It was interesting, but they talked in some terms that I wasn't familiar with.
- It would depend if I had questions or not.
- Making science and physics fun.
- Most of the subjects were boring and the jokes the hosts made kind of made me feel stupid. I didn't get it.
- Ratings? I didn't really rate anything. As far as the call ins I would not call in because I wouldn't be listening to the show. I'm a big talk radio fan and there are just too many good shows to listen to. I do not have time to listen to something I'm only moderately interested in, especially w/all the guest hosts.
- Really enjoyed the show it was very funny yet very informative. I have started watching through the wormhole since listening to the show. It really makes physics understandable.
- Really enjoyed the shows, but most likely would not listen to them live so would not be able to call into the show or submit questions.
- Show is quite boring and not funny at all.
- Some of the topics, although explained so that the layperson could understand, were still a bit challenging to understand. While I might have grasped the concept for the moment, I would never be able to explain it to someone else. I had many questions, but would not necessarily write or call in a question when I could search for the answer myself online.
- StarTalk Radio show was a very informative and entertaining outlet for all things space. The host was accommodating and the guests were very relevant and knowledgeable. Although the episodes were extensive, I thoroughly enjoyed how informative and entertaining it was.
- That is my impression based on what I heard on the show.
- The bill Maher episode that everyone who is religious is ignorant.
- The most interesting parts of each episode (when applicable) was the viewer Q/A. I love hearing about the current developments in science, and NDT explains the answers very well with a positive energy that I enjoy. Also, a live call-in would be great just because it would be more interesting with a back-and-forth, even though I'd probably only participate rarely.
- The podcasts were extremely interesting to listen to and I enjoyed it.
- The show was a little on the boring side, but my husband loved it. The sense of humor of the host was really good in keeping my uninterested ears tuned in.
- The shows were interesting, but ultimately, they weren't my cup of tea; therefore, I probably wouldn't ask any questions either online or on the phone.
- The shows were very thought provoking and many times I went back to replay certain parts to fully understand the impact of what was being stated. I had questions, but being somewhat shy, I don't know if my curiosity would overcome my timidity to call while on the air. I would feel that my question would have to be a really smart one or I'd be embarrassed. Sending an email would be less intimidating.
- The subjects of the interviews are very interesting and intelligent people and I feel like the interviewer is all ego and wouldn't listen to what any of the people had to say.
- The topics was very useful and learning for me im very likely all about it.
- The topics were very different and unique. Got me intrigued.
- These shows were educational and funny as well! I loved listening to them, at times I was laughing out loud at work! Such an engaging way to get people to listen and they were so involving and great.
- These were informative topics, but never spurred any additional questions of mine. The information was interesting and others peoples questions were helpful. I do not think I knew enough to come up with my own questions.

- They pretty well covered their topics.
- This is such a broad subject. Although I enjoy listening to it, I have a hard time understanding the subject matter so I wouldn't know any questions to ask.
- This show was very informative and interesting to me. After listening to most of the links provided I occasionally go to the radio show website and listen to some extra episodes.
- Very informative, unique, likeable, exciting, interesting, user friendly and very easy to relate to.
- Was very entertaining with fun facts and great hosts as well as great guests.
- Well, if I had questions, and it were available, I may call and get an answer.
- What ratings, I don't see anywhere above where it asked me to rate the episodes. If you mean why I selected that I would probably not call in nor submit an online question, it's because I'm more of a passive radio listener and I never actively participate.

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10. What type of music would you prefer to hear throughout the show?

N=129

- Smart music, like the music I heard, not distracting.
- A variation of all music types.
- A variety.
- All is fine.
- Alternative rock.
- Any I like music.
- Any in particular, I thought the music was fine.
- Any kind! I really think they could relate almost anything to the show in some way. I would like to hear more newer music.
- Any type of music is fine by me.
- Anything that would be science related or themed towards the episode. It could be from just about any genre.
- Celestial music would be fitting.
- Classical.
- Classical or Oldies.
- Classical or relaxing style that wouldn't interfere or distract me.
- Classical, Jazz.
- Classical, light rock.
- Dance.
- Does not matter.
- Doesn't really matter to me.
- Dose not matter.
- Easy listening.
- Everything they use is great. Truly.
- For a science radio show, I wouldn't mind some sound effects here and there, but really, I'm not listening for the music. I'm listening in order to hear some informative talk and to perhaps learn something new. I typically do not even notice the music.
- Hard rock.
- Honestly am not all that concerned about the music and it would not effect one way or another my enjoyment of the program.
- I did like the music that was played. Maybe something like the music from 2001 a Space Odyssey etc.
- I did like the music that was provided. I especially liked how the intro music changed after introducing him. Quite cute!
- I did not care for the rap/old school music intro. It sounded out of place to me. Everything else was ok. I think some cosmic instrumental or something of the like would have been better.

- I do not think it is needed
- I don't know.
- I don't mind either way, I didn't notice.
- I don't really have a preference.
- I enjoy all types of music. I really don't have any preference of music. I would like to hear on the show. But the music I did was good!
- I enjoyed the music selections and thought they were funny how they applied to the topics being discussed.
- I enjoyed the music that was presented with the shows. No change needed.
- I enjoyed the music.
- I have no preference.
- I have no preference for the music it had no effect on my experience. I actually found the music fitting to the theme of the show.
- I heard a variety of music throughout the show but I would prefer 80's rock.
- I like modern songs that are currently on the radio and think they add a modern twist to a show.
- I like the balance.
- I like the music they played. It went well with everything.
- I like to listen to easy listening music, so this was different than what I preferred - but it was just fine with me.
- I liked how most of the songs (I think) had to do with outer space things like stars. I'm not sure what type of music I'd prefer to hear. I guess I'd like to hear songs from any genre that go along with the science/outer space theme of the show.
- I liked the Beastie Boys and I thought it had upbeat music, which it should!
- I liked the Beastie Boys song that would play when the show would start and come back from commercial.
- I liked the music clips that were played between breaks, they were applicable to the type of episode I was listening to and they were entertaining as well.
- I liked the music that was already on the show.
- I liked the music you had...it was fitting and related to the subjects.
- I liked the music. I thought it was perfect for the show.
- I liked the typical loud and welcoming music in these series. That's what I would prefer.
- I liked the use of contemporary, catchy music and its usage-- it is easy to kind of tune out during the commercials but the music is that quick wake-up call that pulls the energy back to the program.
- I liked what was heard.
- I really enjoyed the segments related to space such as beastie boys intergalactic. I would like to hear electronic house beats lightly in the background before the show goes to a commercial break. A few suggestions for songs although it is not an electronic house beat but a classic rock song, 'Steve Miller Band - The Joker.' Another song I had in mind would be 'Daft Punk- Robot Rock' that would be amazing. Last but not least, anything psychodelic from Pink Floyd.
- I really liked the classic rock songs. They were an unexpected addition to the show. I liked that they all related somehow to stars.
- I really liked the music they used. I'm a big Beastie Boys fan so hearing their music at the beginning of the show was a welcome surprise. :) I think the upbeat music shows to the audience that we are also here to have fun with science. It's not just a dry boring show. It is show science can be fun too.
- I think the music fit just fine. I mean, I really was much more interested in the content rather than the music but thought that it did tie in well.
- I think the original Beverly Hills theme song is pretty good for the talk show. It's slow paced and picks up nicely.
- I thought the music was fine.
- I thought the music was good as it was, maybe some more dancing spacy sounding music would be good too. Get the blood pumped.
- I thought the selections that were used were perfect for this genre of talk radio.

- I thought the selections were spot on.
- I thought the type of music played was appropriate for the show. I actually got to thinking about songs that would go well together with this format, and I thought a song like Don McClean's Vincent (Starry Night, Starry Night) would be a good choice of music.
- I would not mind any kind as long as it keeps my attention.
- I would prefer to hear top 40/pop music.
- I'd prefer as little music as possible.
- It doesn't matter to me.
- It was a bit repetitive. I think they were trying to focus on songs that literally had certain astronomical themes or words. Eventually that's going to run dry. Could have been more varied.
- It was ok. If I wanted music, I'd just listen to a music station.
- Just relaxing.
- Keep the Music just as it is. Loved that all of the Songs were related to the Show!
- Light music.
- Like what was always playing.
- Loved the music choices and how they related to the topics. They made me think further about what I had heard and those relationships instead of just killing time between breaks. Well done!
- Maybe clips of pertinent music but it really didn't need any.
- Maybe lighter instrumental that doesn't distract so much from the show.
- Maybe some rock, alternative rock.
- Maybe something a bit more mellow or cosmic.
- Mellow music that catches the mind.
- Modern.
- Modern music, ie rock music where the lyrics have something to do with the topic.
- Modern or classical.
- Music by BT. BT has a varied collection of electronic, ambient, movie score and more music. He'd also be a pretty funny guest too.
- Music pertaining to space, ie Rocket Man.
- New age.
- Nice classical.
- None really.
- No preference.
- No preference.
- None.
- None! Who says you have to have music?
- Not really sure.
- Not sure.
- Not sure. Maybe not so modern or pop. Did not feel like it flowed with the show.
- Organ music.
- Pick a genre and stick to it. Any one of the several that played throughout the program.
- Pop songs containing science lyrics.
- Popular music.
- Rap, hip hop, R&B and pop.
- Reggie watts.
- Rock music.
- Rock n roll but it didn't really matter that much.
- Rock, blues or something like that.
- Science/mysteries type of music.
- Soft pop.
- Some easy listening.
- Something more uplifting. This music sort of reminded me of the twilight zone.
- Something relative. Or modern.

- Something softer. I don't care for rape and harsh sounding music. The music sounded like a bunch of noise. 'The Sounds of Silence' or 'Starry ,starry night ' would be appropriate and is much more suiting to my tastes. (I know you were trying to cater to the younger generation and sound cool).
- Something that fits more closely with the content of the show, or at least with the tone. For example, I'd have liked to hear some of the Real Time with Bill Maher music when they had Bill Maher on. The current choices are a big jarring and don't seem to jive with the content.
- The current music was fine.
- The intro and closing music was annoying and didn't seem to fit the show.
- The music chosen for the show was very appropriate!!!
- The music did not leave an impression on me, but I like softer music.
- The music played did not seem to have anything to do with subjects.
- The music should be relevant to the show such as the obvious choice of Gustav Holst's 'The Planets.' The music can be from any genre, not just classical, but it should fit with the show's slogan 'keep looking up' or with a particular episodes subject.
- The music should vary to all types of genres such as hip hop rock country and etc.
- The music that was playing throughout was fine fits my genre.
- The music they played is just fine.
- The music they were playing was fine by me.....I like most kinds of music and I think it really does enhance a program.
- The music was great, a lot of classic rock fitted with the program just well, even a little Madonna was thrown in with lucky star, I thought that was awesome. Don't change the music it's perfect the way it is.
- The music was just fine.
- The music, as long as it's not grating like rap and some heavy metal, doesn't really affect me either way for radio programs that are focused on talk.
- The opening music is quite distracting and while I understand the link, it didn't make me want to listen to the show initially. I don't recall the type of music throughout the show as it's been a few weeks. I would prefer music that is a bit more calming.
- This music that they used on the 'Star Talk Radio.Net' was perfect for the show. I was very much impressed.
- This music was ok with the type of the show.
- Thought using the choices that enhanced the topic was very creative.
- Upbeat, much like the intro song - I really liked it and wanted to hear more! It was great.
- Variety of course.

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