# RECIPIENTS OF MAJOR SCIENTIFIC AWARDS

# A DESCRIPTIVE AND PREDICTIVE ANALYSIS

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Andrew Barbee received his Bachelor of Arts in Bible from Dallas Christian College, earned his Master's Degree in Education from Dallas Baptist University and a superintendent certification from the University of Texas at Arlington. Also, he completed a Doctor of Philosophy in Educational Leadership and Policy Studies at UTA. He is also a court-appointed mediator, and has served in private, charter, and public education as an administrator at Head Start, pre-kindergarten, elementary, junior high, high school campuses, and district offices. In addition, he is an instructor and subject matter expert at a university. He currently resides in Texas with his wife. He is interested in defending the rights of the poor and needy. Andrew enjoys learning, spending time with family, studying Hebrew, and the Jewish culture as it relates to the Bible.

"So God created humankind in his own image; in the image of God he created him: male and female he created them." Genesis 1:27 (Complete Jewish Bible)

For in the union with the Messiah, you are all children of God through this trusting faithfulness; because as many of you as were immersed into the Messiah have clothed yourselves with the Messiah, in whom there is neither Jew nor Gentile, neither slave nor freeman, neither male nor female; for in the union with the Messiah Yeshua, you are all one. (Galatians 3:26-28, *Complete Jewish Bible*)

**Introduction**

As a society, we desire, defend, and argue for equity in any and all areas. Sometimes the law attempts to mandate equity and provide some boundaries. Yet how does the law govern the thoughts, intentions, and actions of the heart? Thus, we need to broaden our understanding of equity. Equity is not an educational issue, nor is it a physiological issue; rather equity is a spiritual issue.

The 14th Amendment to the Constitution of the United States consists of four major clauses relating to citizenship, privileges or immunities, due process, and equal protection. Regarding those four clauses and gender equity, a significant Supreme Court case was Cannon v. University of Chicago in 1979 which determined Title IX of the Higher Education Act contains an implied private cause of action. In education, the equal protection clause was defined in the Brown v. Board of Education Supreme Court case in 1954. In essence, this case involved challenges with segregation. In addition, the Court determined,

> The Court reasoned that denial of opportunity for an adequate education would often be a denial of opportunity to succeed in life, that separation of the races in the schools solely on the basis of race must necessarily generate feelings of inferiority in the disfavored race adversely affecting education as well as other matters, and therefore that the equal protection clause was violated by such separation. (United States Government Public Office, 2016)

Regarding public education, the Court concluded that the doctrine of *separate but equal* had no place.

**Title IX**

In education, Title IX redefined the equal protection clause in 1972. In essence, the intent of Title IX was to prohibit discrimination on the basis of sex in any educational setting which was funded by federal dollars. Thus, Title IX applies to all elementary and secondary schools, community colleges, and universities. Finally, Title IX is often thought of in regards to equity in athletics; however, academics are also under the Title IX umbrella.

**Scholarly Prizes**

Scholarly prizes of note in the scientific field include the Nobel, the National Academy of Sciences Award, and the National Science Foundation Award. Each are treated separately with regard to the relative representation of female recipients.

**Nobel.** Of all the scientific and scholarly prizes awarded in the past century, the Nobel Prize is perhaps the most prestigious and acclaimed. In his will, Alfred Nobel left the majority of his wealth to the establishment of five prizes. Regarding the prizes, the will specifically stated that "prizes to those who, during the preceding year, shall have conferred the greatest benefit on mankind" (Nobel, 2014, The Establishment of the Nobel Prize, para.1). Furthermore, the will stated that, regarding the award of prizes, no consideration be given to the nationality of the candidates. The annual prizes were divided into five categories: physics, chemistry, physiology or medicine, literature, and peace. The first Nobel prizes were awarded in 1901 (Nobel, 2014). The will articulated that the prizes for chemistry and physics are awarded by the Swedish Academy of Sciences, the physiology or medicine prize be awarded by the Karolinska Institute, literature by the Academy in Stockholm, and the peace award be a committee of five people elected by the Norwegian Storting (Nobel, 2014).

The selection process for all Nobel awards is driven by a committee. For an individual to be considered for an award, he/she must be nominated by a person who meets the nomination criteria and/or selected by a member of the governing Nobel committee (Nobel, 2014). All Nobel awards follow a similar process in selecting the Nobel Laureates. In September, nomination forms are distributed and must be submitted to each Nobel committee by February. Subsequently, each committee sends the names of preliminary candidates to experts for their assessment during the months of March through May. Next, from June through August, a report is compiled with recommendations, and submitted to the Academy and or Institute for each award field. During the month of September, the Nobel committee submits recommendations of the final candidates. Also, in October, the Nobel Laureates are chosen, and the names are announced. Finally, the Laureates receive their prize amount, medal, and diploma in December (Nobel, 2014).

The significance of the Nobel award is multifaceted. First, award recipients are individuals who take chances to explore a new perspective, despite the initial odds of success. Next, they question established conclusions. For example, during 2001-2009, numerous important discoveries were made. P. Lauterbur and P. Mansfield developed magnetic resonance imaging (M.R.I.), a technology that has saved thousands of lives (Shalev, 2010). Laureates A. Hershko, A. Ciechanover, and I. Rose lead biochemistry teams that discovered how the human body kills broken protein in cells to defend itself against diseases. This advancement in understanding is being utilized in treating cancer and cystic fibrosis (Shalev, 2010). Finally, A. Fert and P. Grunberg were acknowledged for the discovery of magneto resistance by using the rules of quantum mechanics. These laureates' research allows large amounts of information to be stored on small disks, such as IPods and MP3s (Shalev, 2010).

**National Academy of Science Award.** Along with the Nobel Prize, another distinguished award is presented by the National Academy of Sciences (NAS). One of these awards, within NAS is the Public Welfare Medal. The (NAS) was inaugurated on March 3, 1863 during the Civil War. The NAS was established during the 1850s by a group of scientists, primarily from Massachusetts. The group requested help from Massachusetts Senator Henry Wilson, who helped draft a bill (NAS, 2014). Then, Wilson presented the bill to the Senate on February 20, 1863, where it was passed on March 3, 1863. The bill was approved by the House of Representatives later that day, and was immediately signed by President Lincoln (NAS, 2014).

The selection process of the NAS is propelled by nominations that produce memberships. Furthermore, the nomination process is outlined by NAS with the following criteria, and must be submitted for all awards: First, a letter is received from the nominator and must be submitted outlining the candidate's work and why he/she should be selected. Next, a curriculum vitae—a bibliography listing of the nominees most significant publications—and a suggested citation must be submitted (NAS, 2014). Finally, two letters of support are required and must be written by individuals from institutions outside both the nominator and the nominee's institution.

Members are elected to NAS, and only NAS members may propose candidate nominations. Upon nomination, the candidate is evaluated through an extensive and careful process that results in a final ballot at the NAS annual meeting (NAS, 2014). The NAS has a membership is approximately 2,250, and almost 440 foreign associates, of whom nearly 200 have received Nobel prizes (NAS, 2014).

The significance of the NAS has two main components: government and research. Since its inception, NAS has provided services to the U.S. government. For example, during World War I, NAS members (then only 150) were not able to maintain the request for military advice from the government (NAS, 2014). Thus, in 1916, NAS began the National Research Council with a request from President Wilson. The purpose of the council was to recruit experts from the scientific and technological communities to help with the NAS's advisory work for the government. Wilson acknowledged the value of scientific advice, and issued an executive order, at the end of World War I, requesting the NAS to carry on the National Research Council (NAS, 2014). Succeeding executive orders by President Eisenhower in 1956 and President Bush in 1993 have demonstrated the importance of the National Research Council (NAS, 2014).

**National Science Foundation Award.** Besides the Nobel and NAS, another notable award is presented by the National Science Foundation (NSF). The NSF is an independent Federal agency produced by the 1950 Science Foundation Act. NSF was created to promote the progress of science and support research and education in science and engineering (NSF, 2014). Research is supported by grants and agreements to approximately 2,000 colleges, K-12 school systems, businesses, and other research organizations in the U.S. NSF provides 25% of federal support to academic institutions for basic research (NSF, 2014).

The NSF developed a document called the Proposal & Award Policies & Procedures Guide (PAPPG), which encompasses documents relating to the proposal and award process, consisting of two parts. The NSF Grant Proposal Guide (GPG) contains NSF's proposal requirements and submission guidelines. The NSF Award and Administration Guide (AAG) provides guidance on managing and monitoring the award and administration of grants by NSF (NSF, 2014).

The following criteria must be outlined and defined in the proposal: (1) objectives and scientific, engineering, or educational significance of the proposed work; (2) suitability of the methods to be utilized; (3) qualifications of the examiner and the grantee organization; (4) effect of the activity on the structure of science, engineering and education; and (5) amount of funding needed (NSF, 2014). NSF accepts proposals from all qualified scientists, engineers, and educators. Additionally, NSF encourages women, minorities, and persons with disabilities to engage in its programs.

The NSF proposal processing and review incorporates the several steps: First, the proposals are designated to a NSF program officer that ensures all NSF requirements have been met. Next, the proposals are reviewed by a scientist, engineer, or educator, and three to 10 individuals as ad hoc reviewers, who are experts in a particular field. Subsequently, the program officer makes a recommendation that is reviewed by a division director. Finally, a Grants and Agreement Officer

oversees a review of business, financial, and policy implications, and the award is finalized (NSF, 2014). This entire process, from proposal preparation to award, is completed in 10 months.

The NSF awards help researchers to create knowledge in science, engineering, education, and technology. In addition, multiple discoveries and innovations have begun with NSF support in the following research areas: Arctic and Antarctic, Astronomy and Space, Biology, Chemistry and Materials, Computing, Earth and Environment, Education, Engineering, Mathematics, Nanoscience, People and Society, and Physics. For example, within the Biology research, a discovery of a protein may lead to the treatment for malaria, a wildlife species may provide ideas to spread antibiotic resistance in Africa, and methane-eating microorganisms may help regulate emissions from wetlands (NSF, 2014).

**Women as Recipients of Major Scientific Awards**

Along with careers, women have been underrepresented as recipients of major academic awards (Raise Project, 2016). Individuals who receive awards are considered to be leaders in their fields and receive the highest level of recognition. The RAISE Project claims to be the world's largest awardees database (Raise Project, 2016). It lists over 2,200 STEM and medicine awards and calculates the distribution between men and women. This organization was founded in 1993 by a group of professional women, and was solidified in 2005, after the National Medal of Science Awards was awarded, and they noted no women received an award (Raise Project, 2016). The methodology of the RAISE Project included systematic search of websites for posted awards, followed by classification into the following categories: awardees, award, year of award, awarding body, and the sex of the individual. Furthermore, the sources of data for specific fields are from the NSF for STEM and the American Association of Medical Colleges for Medicine (Raise Project, 2016).

According to the RAISE Project, an overview of the awards in their database consists of the following: 2,245 total awards, 1,759 STEM awards, 363 medical awards, 1,738 single recipient awards, 369 group recipients' awards, and 117 women only awards (Raise Project, 2016). The number of doctoral degrees earned by women has increased during the past years. However, the percentage of awards presented to women has remained below the percent of earned PhD in STEM. For example, in 1981, the percentage of women with individual plus group awards was 3.6%, while in that same year, 22.8% of women earned a PhD in STEM (Raise Project, 2016). In 2000, the percentage of women with individual plus group awards was 14.3%, while 12.4 % were awarded an individual award, and in that same year, 36% of women earned a PhD in STEM (Raise Project, 2016). In 2014, the percentage of women with individual plus group awards was 20.3%, while 19% were awarded an individual award, and during that same year, 40.8% of women earned a PhD in STEM (Raise Project, 2016).

The following organizations award individuals in various disciplines, some of which include math, medical, or sciences. From 1981 to 2015 numerous men and women received awards annually by each organization. The American Association for the Advancement of Science (AAAS) awarded no women and two men in 1981; in 2000, four women and nine men; and in 2015, 10 men and three women (Raise Project, 2016). The Mathematical Association of America (MAA) awarded 14 men and no women in 1981; in 2000 18 men and five women; and in 2015, 25 men and 13 women (Raise Project, 2016). The American Medical Association (AMA) awarded seven men and one woman in 1981; in 2000, four men and one woman; and in 2015 seven men and two women (Raise Project, 2016). The National Academy of Sciences (NAS) awarded 10 men and no women in 1981; in 2000, 12 men and three women; and in 2015, 10 men and eight women (Raise Project, 2016). The National Science Foundation (NSF) awarded two men and no women

in 1981; in 2000, 10 men and three women; and in 2015, six men and three women (Raise Project, 2016). The Nobel (Chemistry, Economic Sciences, Physics, and Physiology or Medicine) awarded nine men and no women in 1981; in 2000, 11 men and no women; and in 2015, eight men and one woman (Raise Project, 2016).

**Nobel Prize.** Regarding the sex of Nobel awardees, between 1981 and 1994, multiple years had no women representation, and a total of three women were awarded. Additionally, between 1995 and 2015, multiple years had no women representation, and a total of nine women were awarded, of which four were awarded in 2009 (Raise Project, 2016).

**NAS Prize.** Regarding the sex of NAS awardees, between 1981 and 1994, on average one woman per year earned an award, with a total of 12 women awarded. However, between 1995 and 2015, the average increased to four women per year, with eight being awarded in 2015 (Raise Project, 2016).

**NSF Award.** Regarding the sex of NSF awardees, between 1981 and 1994, on average one woman per year earned an award, with a total of 18 women awarded. Additionally, between 1995 and 2015, the average was two women per year, with four being awarded in 2015 (Raise Project, 2016).

## Statement of the Problem

Title IX has been studied within the context of athletics (NFHS, 2015, NCAA, 2015; IOC, 2016). However, it has not been explored in the academic context (U.S. DOE, NCES, 2011, College Board, 2013, and NSF, NCSES, 2015), particularly those awards which are national and international.

There is ample evidence regarding Title IX and the increase of women participating in higher education, including graduate and doctoral programs. In other words, Title IX has been studied within the context of athletics and academics, based upon inequality, i.e. bias and discrimination. Also, a limited amount of research has explored female award recipients. Specifically, existing research has not examined the pinnacle of academic performance in the form of national and international awards.

## Purpose of the Study

This research seeks to explore the demographic characteristics of major award recipients in the field of science. However, it does not focus on inequality, but rather equality. The study seeks to determine if a fair playing field and equal opportunity for women in academics has improved since Title IX. Furthermore this study examines demographic characteristics of Nobel Prize, the National Academy of Sciences (NAS) Award, and the National Science Foundation (NSF) Award recipients, including sex, age, and highest degree obtained. The study tests whether or not there is a significant difference with respect to sex, terminal degree type, and age at the time of award obtainment. Also, the study tests if the age when terminal degree was awarded can predict early career award obtainment. The Nobel, NAS, and NSF awards will be examined by demographic characteristics (sex, age, and degree). By exploring sex, degree, age, terminal degree type, and age when terminal degree was awarded could predict late award obtainment.

## Research Questions

In order to determine if a significant difference exists in demographic characteristics, this study focused on three specific science awards. The Chemistry Award within the scientific category of the Nobel, the Public Welfare Medal which is awarded for extraordinary use of science for the public good by the NAS, and the National Medal of Science, within the discipline of Physical Science, which is awarded by the NSF. The following research questions were developed to address the purpose of this study:

1. What are the demographic characteristics (sex, age when presented the award, period of time between highest degree and award, and type of terminal degree) of award recipients for the Nobel Prize in Chemistry between the years 1975-2015?
2. What are the demographic characteristics (sex, age when presented the award, period of time between highest degree and award, and type of terminal degree) of award recipients for the NAS Public Welfare Medal between the years 1975-2015?
3. What are the demographic characteristics (sex, age when presented the award, period of time between highest degree and award, and type of terminal degree) of award recipients for the NSF National Medal Science discipline of Physical Science between the years 1975-2015?
4. Can sex and age when terminal degree was awarded predict early career award obtainment of major scientific awards?

**Research Design**

Data from awardees between the years 1975-2015 were recorded into three categories: the Nobel Prize for Chemistry, the Public Welfare Medal, and the National Medal of Science. For Research Question One, Two, and Three, I collected the demographic characteristics for the Nobel Prize in Chemistry, the NAS Public Welfare Medal, and the NSF National Medal Science discipline of Physical Science for the given time period. Descriptive statistics were incorporated for the awardees, and classified into the following categories: sex, age when awarded, and highest degree attained. A database was created in a table with a frequency count for each group. Since the study involved looking at sex differences and differences across highest degree attained, a logistical regression model was utilized, allowing for multiple variables to be examined simultaneously. Finally, this data can help determine if sex, degree type, and age may predict late career award obtainment as posed in Research Question Four.

**Data Sources**

Ex post facto research may be used in experimental research to test hypotheses (Cohen, Manion, & Morrison, 2013). By studying facts which have occurred, research can be conducted on the influence of one variable on another (Cohen, Manion, & Morrison, 2013). Ex post facto research incorporates preexisting data, allowing one to test relationships between variables.

The data sources were retrieved from three databases the Nobel, NAS, and NSF. The data population includes the recipients of the Noble Prize in Chemistry, Public Welfare Medal awarded by NAS, and the National Medal of Science, within the discipline of Physical Science, awarded by NSF. Each prize is awarded annually, and the data focus on a time period of 40 years from 1975-2015. The data were entered in SPSS Version 23, allowing for descriptive statistics and logistical regression analysis. Descriptive statistics includes the collection, alignment, explanation, and presentation of data (Bluman, 2008). Logistic regression emphasizes the possibility of a proposed outcome when a dependent variable is divided into parts and scored as 0 or 1 (Tabachnick & Fidell, 2007). For the purpose of this study, the sex was coded as males (0) and females (1). The dependent variable was early career award obtainment, defined in this study as less than or equal to 30 years.

Logistic regression was chosen because the dependent variable could only have two possible options. In other words, the early career award obtainment can only be met with a *yes* or *no* answer. Research Questions 1-3 employed descriptive statistics, and question four utilized logistic regression. Logistic regression is appropriate because it lacks restrictions of many statistical tests and can be leveraged to analyze complex data sets (Tabachnick & Fidell, 2007). However, challenges may occur if limited numbers of variables exist. Also, logistical regression

assumes a linear relationship between variables.

**Sampling Procedures**

The Nobel is awarded to distinct individuals who have benefited humanity. Award recipients of the Nobel include individuals who continue to explore areas of interest within their field in spite of hardships. The Nobel is a prestigious award, and laureates impact the science learning community, often in the areas of technology or medicine. The NAS provides research for the U.S. government, including scientific and technological innovations to benefit the military. Furthermore, the National Research Council was developed by the NAS, which was developed to promote the progress of science, and support research and education in science and engineering. Finally, due to Title IX being implemented in 1972, the award data gathered for the present study focused on the time period from 1975 to 2015.

**Descriptive Statistics**

Table 4.1 provides historical data of the sex of awardees for the Nobel, NAS, and NSF between 1975 and 2015 and is relevant for Research Questions #1, 2, and 3. More specifically, it focuses on the Nobel Prize in Chemistry, the Public Welfare Medal, and the National Medal of Science within the discipline of physical science. A total of 225 awardees were examined, including 209 men (93%) and 16 women (7%). Only one woman received the Nobel Prize in Chemistry from 1975-2015.

Table 4.2 is a representation of data to support Research Question #1, and provides following data from the Nobel website, universities, and academic journals, including the age when awarded degree, the number of years between the degree and award, and the age when awarded the Nobel Prize in Chemistry. Additionally, the table provides the mean and standard deviation for the above referenced categories, focusing on the years 1975-2015. This period is significant because it reflects prizes awards after Title IX became law in 1972.

Table 4.3 provides the age of the awardees from the Nobel by categories of every 10 years between 1975 and 2015. Of the 86 award recipients, 99% were male and 1% female. Additionally, 37% received their award between the ages of 60-69, while 28% received their award between 50 and 59, and 16% received their award between the ages of 70-79. Range of ages for recipients varied significantly. For example, Hartncit Michel was the youngest individual to be awarded the Nobel Prize in Chemistry in 1988 (40 years old, while John B. Fenn was the oldest to be awarded in 2002 (85 years old).

One of the reasons Title IX was developed was to ensure sex discrimination diminished. Additionally, Title IX has been studied within the context of athletics, and has had a consistent increase in female participation at the high school, university, and the Olympics. However, the impact of Title IX has not been explored in academics, specifically science awards at the national and international level. Thus, I decided to focus on the international Nobel Prize in Chemistry. Additionally, Chemistry was chosen due to the previously reported data regarding doctoral degrees awarded to men and women. Out of the examined scientific fields, chemistry had the highest percentage of women earning a doctorate (39%). Subsequently, I examined which country was credited with this award from 1975-2015, and focused on the United States, since Title IX became law in that country. Of the 86 award recipients, the United States was credited with 52 (60%), and only one female, Ada E. Yonath, received the award between 1975 and 2015 (Shalev, 2010; Nobel, 2016).

Eight women have received the NAS Public Welfare Medal award from 1975 to 2015, the youngest of whom was 18 and the oldest was 32 years old when awarded their degree. The average age of the women was 26.2, reflecting a one-year difference from the cumulative average.

Regarding the time between degree and award, the most was 61 and the least was 26 years. The mean for years between degrees for the women was 43.5, representing 1.3 years less than the overall average. The youngest woman was 49, and the oldest was 81 years old when awarded. The average age of the women was 69.6, representing a difference of 2.4 years from the cumulative average. The Public Welfare Medal was awarded to women in 1977, 1979, 1983, 2003, 2007, 2008, 2010 and 2013. In other words, from 1975 to 2005, only four women received the award. However, from 2005 to 2015, four women have received the award. Table 4.4 is a representation of data to support Research Question #2 and provides a summary of the mean and standard deviation for age, years between degree and award, and age they received the NAS Public Welfare Medal from 1975-2015.

Table 4.5 provides the age of the awardees from the NAS by categories of every 10 years between 1975 and 2015. Of the 42 award recipients, 81% were male and 9% female. Furthermore, 45% received their award between the ages of 70-79%, 19% received their award between the ages of 60-69, and 14% was represented in two age categories 50-59 and 80-89. Melinda Gates was the youngest individual to be awarded the NAS, Public Welfare Medal in 2013 and was 49 years old. Arnold O. Beckman was the oldest individual to be awarded in 1999 and was 99 years old.
Table 4.5

Seven women have received the NSF National Medal of Science award within the discipline of Physical science from 1975 to 2015. The youngest woman was 24, and the oldest was 28 years old when awarded their degree. The average age of the women was 25.9, which is the same as the cumulative average. Time between degrees was at most 61 and at least was 40 years. The mean of the years between degrees for the women was 44.9, representing 1.5 years more than the overall average. The youngest woman was 63 and the oldest was 87 years old when awarded, while the average age of the women was 70.7, representing a difference of 1.2 years from the cumulative average. The National Medal of Science within the discipline of Physical science was awarded to women in 1975, 1983, 1993, 2007, 2009, 2011, and 2014. Approximately one award every ten years was awarded from 1975-2005. However, during 2005-2015, an award was received by women generally every two years. Table 4.6 is a representation of data to support Research Question #3, and provides a mean and standard deviation of the NSF National Medal of Science for age when awarded degree, the number of years between the degree and award, and the age when awarded within the discipline of physical Science from 1975-2015.

Table 4.7 provides the age of the awardees from the NSF by categories of every 10 years between 1975 and 2015. Of the 97 award recipients, 93% were male and 7% were female. Also, 40% received their award between the ages of 60-69, 29% received their award between the ages of 70-79, and 18% between the ages of 80-89. Paul Chu (Ching-Wu) was the youngest individual to be awarded the NSF, National Medal of Science within the discipline of the Physical Science in 1988 at the age of 47. Arnold O. Beckman and Gilbert F. White were the oldest to be awarded in 1989, both 89 years old.

Table 4.8 includes a summary relevant to Research questions 1, 2, and 3, showing sex and the number of early and late awardees for the merged data set of Nobel, NAS Public Welfare Medal, and the NSF National Medal of Science within the discipline of physical science between 1975 and 2015. Career award obtainments were calculated by the number of years between the degree and award. *Early* obtainment was identified by a period of 30 years or less, while *late* obtainment was identified by 31 years or more. Of the 209 male award recipients, 43 received their award early (21%), while 166 (79%) received their award late. Similarly, of the 16 female award recipients, two received their award early (13%), while 14 (87%) received their award late.

Table 4.9 provides the age of the awardees and a summary of the Nobel, NAS, and NSF by categories of every 10 years between 1975 and 2015. Of the 225 award recipients, 93% were male and 7% female. In addition, all three awards represented multiple age brackets, with ranges of 50-59, 60-69, 70-79, and 80-89. The ranges, 60-69 and 70-79, were represented in all three with 60-69 leading in the Nobel and NSF. Other age groups which were present included 50-59 and 80-89. The 50-59 range was present in the Nobel and NAS, while the 80-89 was present in NAS and NSF.

**Inferential Statistics**

A logistic regression analysis was conducted to determine if sex and age when terminal degree was awarded could predict early career award obtainment with a total of 225 awardees. Coding for the dependent variable of early or late career award included a 0 or 1, based upon the number of years between the degree and award. *Early* obtainment was identified by a period of 30 years or less and coded as 0, while *late* obtainment was identified by 31 years or more and coded as a 1. Also, coding for the independent variable of sex was a 0 or 1, with 0 for men and 1 for women.

Thus only one variable, the age when degree awarded, was found to predict early award receipt. Table 4.10 provides a summary and identifies an odds ratio: for every one-year increase in age when terminal degree awarded, there is an 18% decrease in probability of obtaining an early career award. However, a caveat needs to be mentioned, that a small number of women award recipients made logistic predictions difficult.

**Discussion**

The key findings which emerged from the study, within the context of the research questions, focused on the age and sex of award recipients for the Nobel Prize in Chemistry, the NAS Public Welfare Medal, and the NSF National Medal of science within the discipline of Physical Science. Additionally, the time period focused on the years 1975 to 2015, indicated the years just after adoption of Title IX. Finally, the study examined if sex and age when terminal degree was awarded could predict early career obtainment of major scientific awards.

Regarding the Nobel, NAS, and NSF between the years 1975 to 2015, the tipping point has begun to occur. The Nobel Prize in Chemistry, an international award, has only been awarded to one female, Dr. Ada E. Yonath (Nobel, 2016). The NAS, Public Welfare Medal in the United States has had four women awarded from 1975 to 2005, and four also from 2005 to 2015. During the last 10 years, the same numbers of women have been awarded as in the previous 30 years. For the NSF, National Medal of Science within the discipline of Physical Science awarded in the United States, from 1975 to 2005, one woman was awarded every 10 years. From 2005 to 2015, an award was received by women generally every two years. During the past 30 years, women received an award every 10 years, with this pattern increasing to one award every two years.

Findings of the current study indicate that within the context of athletics and academics at each progressive stage, Title IX has had a positive impact on girls' and women's participation. Regarding athletics, high school, college, and Olympic participation has continually increased since 1972. In academics, women have systematically increased participation in the sciences at all levels, culminating in receiving top scientific awards. However, the rate of increase has been more pronounced in the context of athletics.

Another explanation for this trend may be Bandura's Social Cognitive Theory. From the social cognitive perspective, self-efficacy helps produce vicarious outcomes. Furthermore, self-efficacy has two aspects, including self-control and thought process (Bandara, 1986). Self-control is a product of our thoughts, decisions, actions, and habits. And our thought process, our belief,

impacts our actions and success. Therefore, our future thoughts and beliefs have a negative or positive outcomes, and can be profoundly influenced by vicarious experiences, such as witnessing an individual from similar circumstances achieve impressive success in athletics of academics.

For example, the only female Nobel Laureate in Chemistry from 1975-2015, is Ada E. Yonath. Dr. Yonath was born in Jerusalem, Israel to a poor family which rented a four-bedroom apartment with two additional families. Yet, despite her circumstances, her surroundings did not dampen her enormous curiosity. Additionally, her parents were raised in Judaism and learned the Hebrew language. Dr. Yonath went to school based up these principles and also learned Hebrew. Her father died when she was 11 years old, and her mother, encouraged her desire to continually learn (Nobel, 2016). Thus, in Dr. Yonath's life, her parents and specifically her mother, had a positive vicarious effect on her learning, belief, and life.

**Implications**

Title IX is having a positive incremental effect on the relative representation of women receiving major scientific awards. Recall, Title IX to date is 44 and the mean for all examined awards recipients age is 68. The difference of the average age of award recipients and when Title IX became a law is 24 years. Thus, the future female award recipients are entering the prime of their careers and are in the field conducting research. The next two decades should produce an exponential increase in the number of major scientific awards earned by women. Furthermore, this study examined awardees during a 40-year period, and focused on the pinnacle of scientific awards, which is the apex of greater representation of women in science. This study focused on the most prestigious scientific awards to provide a broad understanding of the impact of Title IX on gender equity.

**Limitations**

Regarding the limitations for the study the following are three major constraints. First, is the number of awards. In the current study only three awards were examined within the context of the Nobel, NAS, and NSF. Next, is the number of awardees only being 225. This total number limited the amount of statistical data which could be analyzed. Therefore, by expanding the total number of awardees additional data analysis could be conducted. Finally, the forty year period from 1975 to 2015 could be expanded to aide in the total number of major scientific awards.

**Conclusion**

Other research needs to be conducted expanding the awardees and awards of this study. Recall the RAISE Project has an overview of more than 2,000 awards, including but not limited to STEM and medical fields. This could be a starting point to determine names, and then determine the demographic characteristics of award recipients. Regarding qualitative research, women could be interviewed who have reached the pinnacle in their scientific field, and the application of social cognitive theory could be tested more directly. Also, future research could consist of a closer examination of graduate science programs during the past 40 years. This research would focus on which programs and scientific fields are being entered, what patterns emerge, and why.

Title IX has directly impacted the number of female science award recipients. The law has provided a parameter to ensure fairness occurs in every aspect of education. Thus, Title IX, enacted four decades ago, continues to have a positive impact regarding discrimination on the basis of sex. The current study suggests the representation of women in the top of scientific fields will reach a tipping point during the next two decades. Due to the workforce becoming more diversified, and the drastic increase of girls and women participating in athletics, women have more equity.

Additionally, in the academic arena, as the representation of girls, young ladies, and women continue to increase as professionals, advanced professionals, and leaders, a climactic moment will occur. Furthermore, the pace of this change will gain great momentum as society begins to remember it has been aligned to the image of the Messiah, through a union of trusting, into a community of unity. Thus, one of the purposes of trusting is to enlarge the capacity of a nation to contain Him in much greater measures than has been before.

*Sex of Awardees of Nobel, NAS, and NSF: 1975-2015*

| Sex | Nobel | NAS | NSF | Total |
|---|---|---|---|---|
| Men | 85 | 34 | 90 | 209 |
| Women | 1 | 8 | 7 | 16 |
| Total | 86 | 42 | 97 | 225 |

*Nobel Prize in Chemistry: 1975-2015 (N=86)*

| Category | Mean | SD |
|---|---|---|
| Age Awarded Degree | 27.3 | 3.9 |
| Years Between Degree and Award | 35.9 | 11.2 |
| Age Received Award | 63.1 | 10.7 |

*Age at Award, Nobel Prize in Chemistry: 1975-2015 (N=86)*

| Age | Male | Female | Total |
|---|---|---|---|
| 40-49 | 9 | 0 | 9 |
| 50-59 | 24 | 0 | 24 |
| 60-69 | 32 | 0 | 32 |
| 70-79 | 13 | 1 | 14 |
| 80-89 | 7 | 0 | 7 |
| **Total** | **85** | **1** | **86** |

*NAS, Public Welfare Medal: 1975-2015 (N=42)*

| Category | Mean | SD |
|---|---|---|
| Age Awarded Degree | 27.2 | 7.7 |
| Years Between Degree and Award | 44.8 | 12.5 |
| Age Received Award | 72 | 11.7 |

*Age at Award, NAS, Public Welfare Medal: 1975-2015 (N=42)*

| Age | Male | Female | Total |
|---|---|---|---|
| 40-49 | 0 | 1 | 1 |
| 50-59 | 5 | 1 | 6 |
| 60-69 | 7 | 1 | 8 |
| 70-79 | 15 | 4 | 19 |
| 80-89 | 5 | 1 | 6 |
| 90-99 | 2 | 0 | 2 |
| **Total** | **34** | **8** | **42** |

*NSF, National Medal of Science within the Discipline of Physical Science: 1975-2015 (N=97)*

| Category | Mean | SD |
|---|---|---|
| Age Awarded Degree | 26 | 2.8 |
| Years Between Degree and Award | 43.4 | 10 |
| Age Received Award | 69.5 | 9.5 |

*Age at Award, NSF, National Medal of Science discipline of Physical Science: 1975-2015 (N=97)*

| Age | Male | Female | Total |
|---|---|---|---|
| 40-49 | 2 | 0 | 2 |
| 50-59 | 11 | 0 | 11 |
| 60-69 | 34 | 5 | 39 |
| 70-79 | 28 | 0 | 28 |
| 80-89 | 15 | 2 | 17 |
| **Total** | **90** | **7** | **97** |

*Sex, Early or Late Awardees for Nobel, NAS, and NSF: 1975-2015 (N=225)*

| Sex | Early | Late | Total |
|---|---|---|---|
| Male | 43 | 166 | 209 |
| Female | 2 | 14 | 16 |
| Total | 45 | 180 | 225 |

*Summary of Age at Award, Nobel Prize in Chemistry, NAS, Public Welfare Medal, and NSF, National Medal of Science discipline of Physical Science: 1975-2015 (N=225)*

| Age | Male | Female | Total |
|---|---|---|---|
| 40-49 | 11 | 1 | 12 |

| | | | |
|---|---|---|---|
| 50-59 | 40 | 1 | 41 |
| 60-69 | 73 | 6 | 79 |
| 70-79 | 56 | 5 | 61 |
| 80-89 | 27 | 3 | 30 |
| 90-99 | 2 | 0 | 2 |
| **Total** | **209** | **16** | **225** |

*Summary of Age at Award, Nobel Prize in Chemistry, NAS, Public Welfare Medal, and NSF, National Medal of Science discipline of Physical Science: 1975-2015 (N=225)*

| **Age** | **Male** | **Female** | **Total** |
|---|---|---|---|
| 40-49 | 11 | 1 | 12 |
| 50-59 | 40 | 1 | 41 |
| 60-69 | 73 | 6 | 79 |
| 70-79 | 56 | 5 | 61 |
| 80-89 | 27 | 3 | 30 |
| 90-99 | 2 | 0 | 2 |
| **Total** | **209** | **16** | **225** |

*Logistic Regression: Career Award Obtainment by Awardees*

| **Independent** | **B** | **S.E.** | **Wald** | **df** | **Sig.** | **Exp(B)** |
|---|---|---|---|---|---|---|
| Sex | 0.535 | 0.789 | 0.459 | 1 | 0.498 | 1.708 |
| Age Terminal Degree Awarded | -0.198 | 0.055 | 13.207 | 1 | 0.001 | 0.82 |
| Constant | 6.744 | 1.507 | 20.025 | 1 | 0.001 | 848.691 |

# APPENDIX A

## NOBEL PRIZE DATA 1

| Name | Prize | Sex | AgeAwarded | HighestDegree | TimeBetwDegr |
|---|---|---|---|---|---|
| Ada E. Yonath | Nobel | 1 | 29 | 3 | 41 |
| John Warcap Cornforth | Nobel | 0 | 24 | 3 | 34 |
| Vladimir Prelog | Nobel | 0 | 23 | 4 | 46 |
| William Nun Lipscomb | Nobel | 0 | 27 | 3 | 30 |
| Ilya Prigogine | Nobel | 0 | 24 | 6 | 36 |
| Peter Denis Mitchell | Nobel | 0 | 31 | 3 | 27 |
| Herbert Charles Brown | Nobel | 0 | 26 | 3 | 41 |
| Georg Fridriech Kari Wittig | Nobel | 0 | 35 | 3 | 47 |
| Paul Berg | Nobel | 0 | 26 | 3 | 28 |
| Walter Gilbert | Nobel | 0 | 25 | 6 | 23 |
| Frederick Sanger | Nobel | 0 | 25 | 3 | 37 |
| Fenichi Fukui | Nobel | 0 | 23 | 3 | 40 |
| Roald Hoffman | Nobel | 0 | 25 | 3 | 19 |
| Aaron Klug | Nobel | 0 | 27 | 3 | 29 |
| Henry Taube | Nobel | 0 | 25 | 3 | 43 |
| Robert Bruce Merrifield | Nobel | 0 | 28 | 3 | 35 |
| Herbert Aaron Hauptman | Nobel | 0 | 37 | 3 | 31 |
| Jerome Karie | Nobel | 0 | 26 | 3 | 41 |
| Dudley Robert Herschbach | Nobel | 0 | 26 | 3 | 28 |
| Yuan Tseh Lee | Nobel | 0 | 29 | 3 | 21 |
| John Charles Polanyi | Nobel | 0 | 23 | 3 | 34 |
| Donald James Cram | Nobel | 0 | 28 | 3 | 40 |
| Jean-Marie Pierre Lehn | Nobel | 0 | 24 | 3 | 24 |
| Charles John Pedersen | Nobel | 0 | 23 | 2 | 60 |
| Johann Deisenhofer | Nobel | 0 | 31 | 3 | 14 |
| Robert Huber | Nobel | 0 | 26 | 3 | 25 |
| Hartmut Michel | Nobel | 0 | 29 | 3 | 11 |
| Sidney Altman | Nobel | 0 | 28 | 3 | 22 |
| Thomas Robert Cech | Nobel | 0 | 28 | 3 | 14 |
| Elias James Corey | Nobel | 0 | 23 | 3 | 39 |
| Richard Robert Ernst | Nobel | 0 | 29 | 3 | 29 |
| Rudolph Arthur Marcus | Nobel | 0 | 23 | 3 | 46 |
| Kary Banks Mullis | Nobel | 0 | 28 | 3 | 21 |
| Michael Smith | Nobel | 0 | 24 | 3 | 37 |
| George Andrew Olah | Nobel | 0 | 50 | 3 | 17 |
| Paul J. Crutzen | Nobel | 0 | 35 | 3 | 27 |
| Mario J. Molina | Nobel | 0 | 29 | 3 | 23 |
| **Name** | **Prize** | **Sex** | **AgeAwarded** | **HighestDegree** | **TimeBetwDegr** |
| F. Sherwood Rowland | Nobel | 0 | 25 | 3 | 43 |

| | | | | | |
|---|---|---|---|---|---|
| Robert F. Curl Jr. | Nobel | 0 | 24 | 3 | 39 |
| Sir Harold W. Kroto | Nobel | 0 | 25 | 3 | 32 |
| Richard E. Smalley | Nobel | 0 | 30 | 3 | 23 |
| Paul D. Boyer | Nobel | 0 | 25 | 3 | 54 |
| John E. Walker | Nobel | 0 | 28 | 3 | 28 |
| Jens C. Skou | Nobel | 0 | 36 | 7 | 43 |
| Walter Kohn | Nobel | 0 | 25 | 3 | 50 |
| John A. Pople | Nobel | 0 | 28 | 3 | 47 |
| Ahmed H. Zewail | Nobel | 0 | 28 | 3 | 25 |
| Alan J. Heeger | Nobel | 0 | 25 | 3 | 39 |
| Alan G. MacDiarmid | Nobel | 0 | 26 | 3 | 47 |
| Hideki Shirakawa | Nobel | 0 | 30 | 5 | 34 |
| William S. Knowles | Nobel | 0 | 25 | 3 | 59 |
| Ryoji Noyori | Nobel | 0 | 29 | 5 | 34 |
| K. Barry Sharpless | Nobel | 0 | 27 | 3 | 33 |
| John B. Fenn | Nobel | 0 | 23 | 3 | 62 |
| Koichi Tanaka | Nobel | 0 | 24 | 1 | 19 |
| Kurt Wuthrich | Nobel | 0 | 26 | 3 | 38 |
| Peter Agre | Nobel | 0 | 25 | 7 | 29 |
| Roderick MacKinnon | Nobel | 0 | 26 | 7 | 21 |
| Aaron Ciechanover | Nobel | 0 | 28 | 7 | 29 |
| Avram Hershko | Nobel | 0 | 32 | 3 | 35 |
| Irwin Rose | Nobel | 0 | 26 | 3 | 52 |
| Yves Chauvin | Nobel | 0 | 24 | 1 | 51 |
| Robert H. Grubbs | Nobel | 0 | 26 | 3 | 37 |
| Richard R. Schrock | Nobel | 0 | 26 | 3 | 34 |
| Roger D. Kornberg | Nobel | 0 | 25 | 3 | 34 |
| Gerhard Ertl | Nobel | 0 | 29 | 3 | 42 |
| Osamu Shimomura | Nobel | 0 | 32 | 3 | 48 |
| Martin Chalfie | Nobel | 0 | 30 | 3 | 31 |
| Roger Y. Tsien | Nobel | 0 | 25 | 3 | 31 |
| Venkatraman Ramakrishnan | Nobel | 0 | 24 | 3 | 33 |
| Thomas A. Steitz | Nobel | 0 | 26 | 3 | 43 |
| Richard F. Heck | Nobel | 0 | 23 | 3 | 56 |
| Ei-ichi Negishi | Nobel | 0 | 28 | 3 | 47 |
| Akira Suzuki | Nobel | 0 | 29 | 3 | 51 |
| Dan Shechtman | Nobel | 0 | 31 | 3 | 39 |
| Robert J. Lefkowitz | Nobel | 0 | 23 | 7 | 46 |
| **Name** | **Prize** | **Sex** | **AgeAwarded** | **HighestDegree** | **TimeBetwDegr** |
| Brian K. Kobilka | Nobel | 0 | 26 | 7 | 31 |

| | | | | | |
|---|---|---|---|---|---|
| Martin Karplus | Nobel | 0 | 23 | 3 | 60 |
| Michael Levitt | Nobel | 0 | 25 | 3 | 41 |
| Arieh Warshel | Nobel | 0 | 29 | 3 | 44 |
| Eric Betzig | Nobel | 0 | 28 | 3 | 26 |
| Stefan W. Hell | Nobel | 0 | 28 | 3 | 24 |
| William E. Moerner | Nobel | 0 | 29 | 3 | 32 |
| Tomas Lindahl | Nobel | 0 | 29 | 3 | 48 |
| Paul Modrich | Nobel | 0 | 27 | 3 | 42 |
| Aziz Sancar | Nobel | 0 | 31 | 3 | 38 |

APPENDIX B

NOBEL PRIZE DATA 2

NOBEL PRIZE DATA 2

| Name | Prize | AwardType | AwardYear | AgeAwarded | EarlyLate |
|---|---|---|---|---|---|
| Ada E. Yonath | Nobel | 1 | 2009 | 70 | 1 |
| John Warcap Cornforth | Nobel | 1 | 1975 | 58 | 1 |
| Vladimir Prelog | Nobel | 1 | 1975 | 69 | 1 |
| William Nun Lipscomb | Nobel | 1 | 1976 | 57 | 0 |
| Ilya Prigogine | Nobel | 1 | 1977 | 60 | 1 |
| Peter Denis Mitchell | Nobel | 1 | 1978 | 58 | 0 |
| Herbert Charles Brown | Nobel | 1 | 1979 | 67 | 1 |
| Georg Fridriech Kari Wittig | Nobel | 1 | 1979 | 82 | 1 |
| Paul Berg | Nobel | 1 | 1980 | 54 | 0 |
| Walter Gilbert | Nobel | 1 | 1980 | 48 | 0 |
| Frederick Sanger | Nobel | 1 | 1980 | 62 | 1 |
| Fenichi Fukui | Nobel | 1 | 1981 | 63 | 1 |
| Roald Hoffman | Nobel | 1 | 1981 | 44 | 0 |
| Aaron Klug | Nobel | 1 | 1982 | 56 | 0 |
| Henry Taube | Nobel | 1 | 1983 | 68 | 1 |
| Robert Bruce Merrifield | Nobel | 1 | 1984 | 63 | 1 |
| Herbert Aaron Hauptman | Nobel | 1 | 1985 | 68 | 1 |
| Jerome Karie | Nobel | 1 | 1985 | 67 | 1 |
| Dudley Robert Herschbach | Nobel | 1 | 1986 | 54 | 0 |
| Yuan Tseh Lee | Nobel | 1 | 1986 | 50 | 0 |
| John Charles Polanyi | Nobel | 1 | 1986 | 57 | 1 |
| Donald James Cram | Nobel | 1 | 1987 | 68 | 1 |
| Jean-Marie Pierre Lehn | Nobel | 1 | 1987 | 48 | 0 |
| Charles John Pedersen | Nobel | 1 | 1987 | 83 | 1 |
| Johann Deisenhofer | Nobel | 1 | 1988 | 45 | 0 |
| Robert Huber | Nobel | 1 | 1988 | 51 | 0 |
| Hartmut Michel | Nobel | 1 | 1988 | 40 | 0 |
| Sidney Altman | Nobel | 1 | 1989 | 50 | 0 |
| Thomas Robert Cech | Nobel | 1 | 1989 | 42 | 0 |
| Elias James Corey | Nobel | 1 | 1990 | 62 | 1 |
| Richard Robert Ernst | Nobel | 1 | 1991 | 58 | 0 |
| Rudolph Arthur Marcus | Nobel | 1 | 1992 | 69 | 1 |
| Kary Banks Mullis | Nobel | 1 | 1993 | 49 | 0 |
| Michael Smith | Nobel | 1 | 1993 | 61 | 1 |
| George Andrew Olah | Nobel | 1 | 1994 | 67 | 0 |
| Paul J. Crutzen | Nobel | 1 | 1995 | 62 | 0 |
| **Name** | **Prize** | **AwardType** | **AwardYear** | **AgeAwarded** | **EarlyLate** |
| Mario J. Molina | Nobel | 1 | 1995 | 52 | 0 |
| F. Sherwood Rowland | Nobel | 1 | 1995 | 68 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| Robert F. Curl Jr. | Nobel | 1 | 1996 | 63 | 1 |
| Sir Harold W. Kroto | Nobel | 1 | 1996 | 57 | 1 |
| Richard E. Smalley | Nobel | 1 | 1996 | 53 | 0 |
| Paul D. Boyer | Nobel | 1 | 1997 | 79 | 1 |
| John E. Walker | Nobel | 1 | 1997 | 56 | 0 |
| Jens C. Skou | Nobel | 1 | 1997 | 79 | 1 |
| Walter Kohn | Nobel | 1 | 1998 | 75 | 1 |
| John A. Pople | Nobel | 1 | 1998 | 73 | 1 |
| Ahmed H. Zewail | Nobel | 1 | 1999 | 53 | 0 |
| Alan J. Heeger | Nobel | 1 | 2000 | 64 | 1 |
| Alan G. MacDiarmid | Nobel | 1 | 2000 | 73 | 1 |
| Hideki Shirakawa | Nobel | 1 | 2000 | 64 | 1 |
| William S. Knowles | Nobel | 1 | 2001 | 84 | 1 |
| Ryoji Noyori | Nobel | 1 | 2001 | 63 | 1 |
| K. Barry Sharpless | Nobel | 1 | 2001 | 60 | 1 |
| John B. Fenn | Nobel | 1 | 2002 | 85 | 1 |
| Koichi Tanaka | Nobel | 1 | 2002 | 43 | 0 |
| Kurt Wuthrich | Nobel | 1 | 2002 | 64 | 1 |
| Peter Agre | Nobel | 1 | 2003 | 54 | 0 |
| Roderick MacKinnon | Nobel | 1 | 2003 | 47 | 0 |
| Aaron Ciechanover | Nobel | 1 | 2004 | 57 | 0 |
| Avram Hershko | Nobel | 1 | 2004 | 67 | 1 |
| Irwin Rose | Nobel | 1 | 2004 | 78 | 1 |
| Yves Chauvin | Nobel | 1 | 2005 | 75 | 1 |
| Robert H. Grubbs | Nobel | 1 | 2005 | 63 | 1 |
| Richard R. Schrock | Nobel | 1 | 2005 | 60 | 1 |
| Roger D. Kornberg | Nobel | 1 | 2006 | 59 | 1 |
| Gerhard Ertl | Nobel | 1 | 2007 | 71 | 1 |
| Osamu Shimomura | Nobel | 1 | 2008 | 81 | 1 |
| Martin Chalfie | Nobel | 1 | 2008 | 61 | 1 |
| Roger Y. Tsien | Nobel | 1 | 2008 | 56 | 1 |
| Venkatraman Ramakrishnan | Nobel | 1 | 2009 | 57 | 1 |
| Thomas A. Steitz | Nobel | 1 | 2009 | 69 | 1 |
| Richard F. Heck | Nobel | 1 | 2010 | 79 | 1 |
| Ei-ichi Negishi | Nobel | 1 | 2010 | 75 | 1 |
| Akira Suzuki | Nobel | 1 | 2010 | 80 | 1 |
| Dan Shechtman | Nobel | 1 | 2011 | 70 | 1 |
| Robert J. Lefkowitz | Nobel | 1 | 2012 | 69 | 1 |
| **Name** | **Prize** | **AwardType** | **AwardYear** | **AgeAwarded** | **EarlyLate** |
| Brian K. Kobilka | Nobel | 1 | 2012 | 57 | 1 |
| Martin Karplus | Nobel | 1 | 2013 | 83 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| Michael Levitt | Nobel | 1 | 2013 | 66 | 1 |
| Arieh Warshel | Nobel | 1 | 2013 | 73 | 1 |
| Eric Betzig | Nobel | 1 | 2014 | 54 | 0 |
| Stefan W. Hell | Nobel | 1 | 2014 | 52 | 0 |
| William E. Moerner | Nobel | 1 | 2014 | 61 | 1 |
| Tomas Lindahl | Nobel | 1 | 2015 | 77 | 1 |
| Paul Modrich | Nobel | 1 | 2015 | 69 | 1 |
| Aziz Sancar | Nobel | 1 | 2015 | 69 | 1 |

APPENDIX C

NAS PUBLIC WELFARE DATA 1

PUBLIC WELFARE DATA 1

| Name | Prize | Sex | AgeAwarded | HighestDegree | TimeBetwDegr |
|---|---|---|---|---|---|
| Leona Baumgartner | Pub.Welfare | 1 | 32 | 7 | 43 |

| | | | | | |
|---|---|---|---|---|---|
| Ida M. Green | Pub.Welfare | 1 | 18 | 0 | 61 |
| Mina Rees | Pub.Welfare | 1 | 29 | 3 | 52 |
| Shirley M. Malcom | Pub.Welfare | 1 | 28 | 3 | 29 |
| Maxine F. Singer | Pub.Welfare | 1 | 26 | 3 | 50 |
| Norman P. Neureiter | Pub.Welfare | 1 | 25 | 3 | 51 |
| Eugenie C. Scott | Pub.Welfare | 1 | 29 | 3 | 36 |
| Melinda Gates | Pub.Welfare | 1 | 23 | 2 | 26 |
| Emilio Q. Daddario | Pub.Welfare | 0 | 24 | 8 | 34 |
| Donald A. Henderson | Pub.Welfare | 0 | 26 | 7 | 24 |
| Cecil H. Green | Pub.Welfare | 0 | 24 | 2 | 55 |
| Walter S. Sullivan | Pub.Welfare | 0 | 22 | 1 | 40 |
| Russell E. Train | Pub.Welfare | 0 | 28 | 8 | 33 |
| Paul Grant Rogers | Pub.Welfare | 0 | 27 | 8 | 34 |
| Theodore M. Hesburgh | Pub.Welfare | 0 | 28 | 10 | 39 |
| I.I. Rabi | Pub.Welfare | 0 | 29 | 3 | 58 |
| William D. Carey | Pub.Welfare | 0 | 26 | 2 | 44 |
| Dale R. Corson | Pub.Welfare | 0 | 24 | 3 | 49 |
| John E. Sawyer | Pub.Welfare | 0 | 24 | 2 | 47 |
| David Packard | Pub.Welfare | 0 | 26 | 2 | 51 |
| C. Everett Koop | Pub.Welfare | 0 | 31 | 4 | 43 |
| Victor F. Weisskopf | Pub.Welfare | 0 | 23 | 9 | 60 |
| Philip H. Abelson | Pub.Welfare | 0 | 26 | 3 | 53 |
| Jerome B. Wiesner | Pub.Welfare | 0 | 25 | 3 | 53 |
| Carl Sagan | Pub.Welfare | 0 | 26 | 3 | 34 |
| Harold Amos | Pub.Welfare | 0 | 34 | 3 | 43 |
| William T. Golden | Pub.Welfare | 0 | 70 | 2 | 17 |
| George W. Thorn | Pub.Welfare | 0 | 23 | 7 | 68 |
| David A. Hamburg | Pub.Welfare | 0 | 22 | 7 | 51 |
| Arnold O. Beckman | Pub.Welfare | 0 | 28 | 3 | 71 |
| Gilbert F. White | Pub.Welfare | 0 | 31 | 3 | 58 |
| David A. Kessler | Pub.Welfare | 0 | 28 | 7 | 22 |
| Norman E. Borlaug | Pub.Welfare | 0 | 28 | 3 | 60 |
| Maurice F. Strong | Pub.Welfare | 0 | 18 | 0 | 57 |
| William H. Foege | Pub.Welfare | 0 | 25 | 7 | 44 |
| Norman R. Augustine | Pub.Welfare | 0 | 24 | 2 | 47 |
| **Name** | **Prize** | **Sex** | **AgeAwarded** | **HighestDegree** | **TimeBetwDegr** |
| Neal F. Lane | Pub.Welfare | 0 | 30 | 3 | 41 |
| Ismail Serageldin | Pub.Welfare | 0 | 28 | 3 | 39 |

| | | | | | |
|---|---|---|---|---|---|
| Harold T. Shapiro | Pub.Welfare | 0 | 29 | 3 | 48 |
| Bill Gates | Pub.Welfare | 0 | 18 | 0 | 40 |
| John E. Porter | Pub.Welfare | 0 | 26 | 8 | 53 |
| Neil deGrasse Tyson | Pub.Welfare | 0 | 33 | 3 | 24 |

APPENDIX D

NAS PUBLIC WELFARE DATA 2

PUBLIC WELFARE DATA 2

| Name | Prize | AwardType | AwardYear | AgeAwarded | EarlyLate |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Leona Baumgartner | Pub.Welfare | 2 | 1977 | 75 | 1 |
| Ida M. Green | Pub.Welfare | 2 | 1979 | 76 | 1 |
| Mina Rees | Pub.Welfare | 2 | 1983 | 81 | 1 |
| Shirley M. Malcom | Pub.Welfare | 2 | 2003 | 57 | 0 |
| Maxine F. Singer | Pub.Welfare | 2 | 2007 | 76 | 1 |
| Norman P. Neureiter | Pub.Welfare | 2 | 2008 | 78 | 1 |
| Eugenie C. Scott | Pub.Welfare | 2 | 2010 | 65 | 1 |
| Melinda Gates | Pub.Welfare | 2 | 2013 | 49 | 0 |
| Emilio Q. Daddario | Pub.Welfare | 2 | 1976 | 58 | 1 |
| Donald A. Henderson | Pub.Welfare | 2 | 1978 | 50 | 0 |
| Cecil H. Green | Pub.Welfare | 2 | 1979 | 79 | 1 |
| Walter S. Sullivan | Pub.Welfare | 2 | 1980 | 62 | 1 |
| Russell E. Train | Pub.Welfare | 2 | 1981 | 61 | 1 |
| Paul Grant Rogers | Pub.Welfare | 2 | 1982 | 61 | 1 |
| Theodore M. Hesburgh | Pub.Welfare | 2 | 1984 | 67 | 1 |
| I.I. Rabi | Pub.Welfare | 2 | 1985 | 87 | 1 |
| William D. Carey | Pub.Welfare | 2 | 1986 | 70 | 1 |
| Dale R. Corson | Pub.Welfare | 2 | 1987 | 73 | 1 |
| John E. Sawyer | Pub.Welfare | 2 | 1988 | 71 | 1 |
| David Packard | Pub.Welfare | 2 | 1989 | 77 | 1 |
| C. Everett Koop | Pub.Welfare | 2 | 1990 | 74 | 1 |
| Victor F. Weisskopf | Pub.Welfare | 2 | 1991 | 83 | 1 |
| Philip H. Abelson | Pub.Welfare | 2 | 1992 | 79 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| Jerome B. Wiesner | Pub.Welfare | 2 | 1993 | 78 | 1 |
| Carl Sagan | Pub.Welfare | 2 | 1994 | 60 | 1 |
| Harold Amos | Pub.Welfare | 2 | 1995 | 77 | 1 |
| William T. Golden | Pub.Welfare | 2 | 1996 | 87 | 0 |
| George W. Thorn | Pub.Welfare | 2 | 1997 | 91 | 1 |
| David A. Hamburg | Pub.Welfare | 2 | 1998 | 73 | 1 |
| Arnold O. Beckman | Pub.Welfare | 2 | 1999 | 99 | 1 |
| Gilbert F. White | Pub.Welfare | 2 | 2000 | 89 | 1 |
| David A. Kessler | Pub.Welfare | 2 | 2001 | 50 | 0 |
| Norman E. Borlaug | Pub.Welfare | 2 | 2002 | 88 | 1 |
| Maurice F. Strong | Pub.Welfare | 2 | 2004 | 75 | 1 |
| William H. Foege | Pub.Welfare | 2 | 2005 | 69 | 1 |
| Norman R. Augustine | Pub.Welfare | 2 | 2006 | 71 | 1 |
| **Name** | **Prize** | **AwardType** | **AwardYear** | **AgeAwarded** | **EarlyLate** |
| Neal F. Lane | Pub.Welfare | 2 | 2009 | 71 | 1 |
| Ismail Serageldin | Pub.Welfare | 2 | 2011 | 67 | 1 |
| Harold T. Shapiro | Pub.Welfare | 2 | 2012 | 77 | 1 |
| Bill Gates | Pub.Welfare | 2 | 2013 | 58 | 1 |
| John E. Porter | Pub.Welfare | 2 | 2014 | 79 | 1 |
| Neil deGrasse Tyson | Pub.Welfare | 2 | 2015 | 57 | 0 |

APPENDIX E

NSF NATIONAL MEDAL DATA 1

NATIONAL MEDAL DATA 1

| Name | Prize | Sex | AgeAwarded | HighestDegree | TimeBetwDegr |
|---|---|---|---|---|---|
| Chien-Shiung Wu | Nat.Medal | 1 | 24 | 3 | 39 |
| Margaret E. Burbidge | Nat.Medal | 1 | 24 | 3 | 40 |
| Vera C Rubin | Nat.Medal | 1 | 26 | 3 | 39 |
| Fay Aizenberg-Selove | Nat.Medal | 1 | 26 | 3 | 55 |
| Esther M. Conwell | Nat.Medal | 1 | 26 | 3 | 61 |
| Sandra M. Faber | Nat.Medal | 1 | 28 | 3 | 39 |
| Shirley A. Jackson | Nat.Medal | 1 | 27 | 3 | 41 |
| Hans A. Bethe | Nat.Medal | 0 | 22 | 3 | 47 |
| Joseph O. Hirschfelder | Nat.Medal | 0 | 26 | 3 | 38 |

| | | | | | |
|---|---|---|---|---|---|
| Lewis H. Sarett | Nat.Medal | 0 | 27 | 3 | 31 |
| E. Bright Wilson, Jr. | Nat.Medal | 0 | 25 | 3 | 42 |
| Samuel A. Goudsmit | Nat.Medal | 0 | 25 | 3 | 49 |
| Herbert S. Gutowsky | Nat.Medal | 0 | 29 | 3 | 28 |
| Frederick D. Rossini | Nat.Medal | 0 | 29 | 3 | 48 |
| Verner E. Suomi | Nat.Medal | 0 | 38 | 3 | 23 |
| Henry Taube | Nat.Medal | 0 | 25 | 3 | 36 |
| George E. Uhlenbeck | Nat.Medal | 0 | 27 | 3 | 49 |
| Richard P. Feynman | Nat.Medal | 0 | 24 | 3 | 37 |
| Herman F. Mark | Nat.Medal | 0 | 26 | 3 | 58 |
| Edward M. Purcell | Nat.Medal | 0 | 26 | 3 | 41 |
| John H. Sinfelt | Nat.Medal | 0 | 24 | 3 | 24 |
| Lyman Spitzer, Jr. | Nat.Medal | 0 | 24 | 3 | 41 |
| Victor F. Weisskopf | Nat.Medal | 0 | 23 | 3 | 48 |
| Philip W. Anderson | Nat.Medal | 0 | 26 | 3 | 33 |
| Yoichiro Nambu | Nat.Medal | 0 | 31 | 4 | 30 |
| Edward Teller | Nat.Medal | 0 | 22 | 3 | 52 |
| Charles H. Townes | Nat.Medal | 0 | 24 | 3 | 43 |
| Maurice Goldhaber | Nat.Medal | 0 | 25 | 3 | 47 |
| Helmut E. Landsberg | Nat.Medal | 0 | 28 | 3 | 49 |
| Walter H. Munk | Nat.Medal | 0 | 30 | 3 | 36 |
| Frederick Reines | Nat.Medal | 0 | 26 | 3 | 39 |
| Bruno B. Rossi | Nat.Medal | 0 | 22 | 3 | 56 |
| Robert J. Schrieffer | Nat.Medal | 0 | 25 | 3 | 27 |
| Solomon J. Buchsbaum | Nat.Medal | 0 | 28 | 3 | 29 |
| Horace R. Crane | Nat.Medal | 0 | 27 | 3 | 52 |
| Herman Feshbach | Nat.Medal | 0 | 25 | 3 | 44 |
| **Name** | **Prize** | **Sex** | **AgeAwarded** | **HighestDegree** | **TimeBetwDegr** |
| Robert Hofstadter | Nat.Medal | 0 | 23 | 3 | 48 |
| Chen Ning Yang | Nat.Medal | 0 | 26 | 3 | 38 |
| Philip H. Abelson | Nat.Medal | 0 | 25 | 3 | 49 |
| Walter M. Elsasser | Nat.Medal | 0 | 23 | 3 | 60 |
| Paul C. Lauterbur | Nat.Medal | 0 | 33 | 3 | 25 |
| George E. Pake | Nat.Medal | 0 | 24 | 9 | 39 |
| James A. Van Allen | Nat.Medal | 0 | 25 | 3 | 48 |
| David Allan Bromley | Nat.Medal | 0 | 26 | 3 | 36 |
| Paul Chu (Ching-Wu) | Nat.Medal | 0 | 27 | 3 | 20 |
| Walter Kohn | Nat.Medal | 0 | 25 | 3 | 40 |
| Norman F. Ramsey | Nat.Medal | 0 | 25 | 3 | 48 |
| Jack Steinberger | Nat.Medal | 0 | 27 | 3 | 40 |

| | | | | | |
|---|---|---|---|---|---|
| Arnold O. Beckman | Nat.Medal | 0 | 28 | 3 | 61 |
| Eugene N. Parker | Nat.Medal | 0 | 24 | 3 | 38 |
| Robert P Sharp | Nat.Medal | 0 | 27 | 3 | 51 |
| Henry M. Stommel | Nat.Medal | 0 | 22 | 1 | 47 |
| Allan M. Cormack | Nat.Medal | 0 | 21 | 2 | 45 |
| Edwin M. McMillan | Nat.Medal | 0 | 26 | 3 | 57 |
| Robert V. Pound | Nat.Medal | 0 | 18 | 0 | 53 |
| Roger R.D. Revelle | Nat.Medal | 0 | 27 | 3 | 54 |
| Arthur L. Schawlow | Nat.Medal | 0 | 28 | 3 | 42 |
| Edward C. Stone | Nat.Medal | 0 | 29 | 3 | 26 |
| Steven Weinberg | Nat.Medal | 0 | 24 | 3 | 34 |
| Eugene M. Shoemaker | Nat.Medal | 0 | 32 | 3 | 32 |
| Val L Fitch | Nat.Medal | 0 | 31 | 3 | 39 |
| Albert W. Overhauser | Nat.Medal | 0 | 26 | 3 | 43 |
| Frank Press | Nat.Medal | 0 | 25 | 3 | 45 |
| Hans G. Dehmelt | Nat.Medal | 0 | 28 | 3 | 45 |
| Peter Goldreich | Nat.Medal | 0 | 24 | 3 | 32 |
| Wallace S. Broecker | Nat.Medal | 0 | 27 | 3 | 38 |
| Martin Schwarzschild | Nat.Medal | 0 | 24 | 3 | 61 |
| Marshall N. Rosenbluth | Nat.Medal | 0 | 22 | 3 | 48 |
| George W. Wetherill | Nat.Medal | 0 | 28 | 3 | 44 |
| Don L. Anderson | Nat.Medal | 0 | 29 | 3 | 36 |
| John N. Bahcall | Nat.Medal | 0 | 27 | 3 | 37 |
| James W. Cronin | Nat.Medal | 0 | 24 | 3 | 44 |
| Leo P. Kadanoff | Nat.Medal | 0 | 23 | 3 | 39 |
| Jeremiah P. Ostriker | Nat.Medal | 0 | 27 | 3 | 36 |
| **Name** | **Prize** | **Sex** | **AgeAwarded** | **HighestDegree** | **TimeBetwDegr** |
| Gilbert F. White | Nat.Medal | 0 | 31 | 3 | 58 |
| Willis E. Lamb, Jr. | Nat.Medal | 0 | 25 | 3 | 62 |
| Marvin L. Cohen | Nat.Medal | 0 | 29 | 3 | 37 |
| Raymond Davis | Nat.Medal | 0 | 28 | 3 | 59 |
| Charles D. Keeling | Nat.Medal | 0 | 26 | 3 | 47 |
| Edward Witten | Nat.Medal | 0 | 25 | 3 | 26 |
| Jason W. Morgan | Nat.Medal | 0 | 29 | 3 | 38 |
| Richard L. Garwin | Nat.Medal | 0 | 21 | 3 | 53 |
| Riccardo Giacconi | Nat.Medal | 0 | 23 | 3 | 49 |
| Brent G. Dalrymple | Nat.Medal | 0 | 26 | 3 | 40 |
| Robert N. Clayton | Nat.Medal | 0 | 25 | 3 | 49 |
| Lonnie G. Thompson | Nat.Medal | 0 | 28 | 3 | 29 |

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|---|---|---|---|---|---|
| Ralph A. Alpher | Nat.Medal | 0 | 27 | 3 | 57 |
| Daniel Kleppner | Nat.Medal | 0 | 27 | 3 | 47 |
| Charles P. Slichter | Nat.Medal | 0 | 25 | 3 | 58 |
| James E. Gunn | Nat.Medal | 0 | 28 | 3 | 42 |
| Berni Alder | Nat.Medal | 0 | 23 | 3 | 60 |
| Warren Washington | Nat.Medal | 0 | 28 | 3 | 45 |
| Yakir Aharonov | Nat.Medal | 0 | 28 | 3 | 49 |
| Sylvester J. Gates, Jr. | Nat.Medal | 0 | 27 | 3 | 34 |
| Sindey D. Drell | Nat.Medal | 0 | 23 | 3 | 62 |
| Burton Richter | Nat.Medal | 0 | 25 | 3 | 56 |
| Sean C. Solomon | Nat.Medal | 0 | 26 | 3 | 41 |

## APPENDIX F

## NSF NATIONAL MEDAL DATA 2

NATIONAL MEDAL DATA 2

| Name | Prize | AwardType | AwardYear | AgeAwarded | EarlyLate |
|---|---|---|---|---|---|
| Chien-Shiung Wu | Nat.Medal | 3 | 1975 | 63 | 1 |
| Margaret E. Burbidge | Nat.Medal | 3 | 1983 | 64 | 1 |
| Vera C Rubin | Nat.Medal | 3 | 1993 | 65 | 1 |
| Fay Aizenberg-Selove | Nat.Medal | 3 | 2007 | 81 | 1 |
| Esther M. Conwell | Nat.Medal | 3 | 2009 | 87 | 1 |
| Sandra M. Faber | Nat.Medal | 3 | 2011 | 67 | 1 |
| Shirley A. Jackson | Nat.Medal | 3 | 2014 | 68 | 1 |
| Hans A. Bethe | Nat.Medal | 3 | 1975 | 69 | 1 |
| Joseph O. Hirschfelder | Nat.Medal | 3 | 1975 | 64 | 1 |
| Lewis H. Sarett | Nat.Medal | 3 | 1975 | 58 | 1 |

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|---|---|---|---|---|---|
| E. Bright Wilson, Jr. | Nat.Medal | 3 | 1975 | 67 | 1 |
| Samuel A. Goudsmit | Nat.Medal | 3 | 1976 | 74 | 1 |
| Herbert S. Gutowsky | Nat.Medal | 3 | 1976 | 57 | 0 |
| Frederick D. Rossini | Nat.Medal | 3 | 1976 | 77 | 1 |
| Verner E. Suomi | Nat.Medal | 3 | 1976 | 61 | 0 |
| Henry Taube | Nat.Medal | 3 | 1976 | 61 | 1 |
| George E. Uhlenbeck | Nat.Medal | 3 | 1976 | 76 | 1 |
| Richard P. Feynman | Nat.Medal | 3 | 1979 | 61 | 1 |
| Herman F. Mark | Nat.Medal | 3 | 1979 | 84 | 1 |
| Edward M. Purcell | Nat.Medal | 3 | 1979 | 67 | 1 |
| John H. Sinfelt | Nat.Medal | 3 | 1979 | 48 | 0 |
| Lyman Spitzer, Jr. | Nat.Medal | 3 | 1979 | 65 | 1 |
| Victor F. Weisskopf | Nat.Medal | 3 | 1979 | 71 | 1 |
| Philip W. Anderson | Nat.Medal | 3 | 1982 | 59 | 1 |
| Yoichiro Nambu | Nat.Medal | 3 | 1982 | 61 | 0 |
| Edward Teller | Nat.Medal | 3 | 1982 | 74 | 1 |
| Charles H. Townes | Nat.Medal | 3 | 1982 | 67 | 1 |
| Maurice Goldhaber | Nat.Medal | 3 | 1983 | 72 | 1 |
| Helmut E. Landsberg | Nat.Medal | 3 | 1983 | 77 | 1 |
| Walter H. Munk | Nat.Medal | 3 | 1983 | 66 | 1 |
| Frederick Reines | Nat.Medal | 3 | 1983 | 65 | 1 |
| Bruno B. Rossi | Nat.Medal | 3 | 1983 | 78 | 1 |
| Robert J. Schrieffer | Nat.Medal | 3 | 1983 | 52 | 0 |
| Solomon J. Buchsbaum | Nat.Medal | 3 | 1986 | 57 | 0 |
| Horace R. Crane | Nat.Medal | 3 | 1986 | 79 | 1 |
| Herman Feshbach | Nat.Medal | 3 | 1986 | 69 | 1 |
| **Name** | **Prize** | **AwardType** | **AwardYear** | **AgeAwarded** | **EarlyLate** |
| Robert Hofstadter | Nat.Medal | 3 | 1986 | 71 | 1 |
| Chen Ning Yang | Nat.Medal | 3 | 1986 | 64 | 1 |
| Philip H. Abelson | Nat.Medal | 3 | 1987 | 74 | 1 |
| Walter M. Elsasser | Nat.Medal | 3 | 1987 | 83 | 1 |
| Paul C. Lauterbur | Nat.Medal | 3 | 1987 | 58 | 0 |
| George E. Pake | Nat.Medal | 3 | 1987 | 63 | 1 |
| James A. Van Allen | Nat.Medal | 3 | 1987 | 73 | 1 |
| David Allan Bromley | Nat.Medal | 3 | 1988 | 62 | 1 |
| Paul Chu (Ching-Wu) | Nat.Medal | 3 | 1988 | 47 | 0 |
| Walter Kohn | Nat.Medal | 3 | 1988 | 65 | 1 |
| Norman F. Ramsey | Nat.Medal | 3 | 1988 | 73 | 1 |
| Jack Steinberger | Nat.Medal | 3 | 1988 | 67 | 1 |
| Arnold O. Beckman | Nat.Medal | 3 | 1989 | 89 | 1 |

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|---|---|---|---|---|---|
| Eugene N. Parker | Nat.Medal | 3 | 1989 | 62 | 1 |
| Robert P Sharp | Nat.Medal | 3 | 1989 | 78 | 1 |
| Henry M. Stommel | Nat.Medal | 3 | 1989 | 69 | 1 |
| Allan M. Cormack | Nat.Medal | 3 | 1990 | 66 | 1 |
| Edwin M. McMillan | Nat.Medal | 3 | 1990 | 83 | 1 |
| Robert V. Pound | Nat.Medal | 3 | 1990 | 71 | 1 |
| Roger R.D. Revelle | Nat.Medal | 3 | 1990 | 81 | 1 |
| Arthur L. Schawlow | Nat.Medal | 3 | 1991 | 70 | 1 |
| Edward C. Stone | Nat.Medal | 3 | 1991 | 55 | 0 |
| Steven Weinberg | Nat.Medal | 3 | 1991 | 58 | 1 |
| Eugene M. Shoemaker | Nat.Medal | 3 | 1992 | 64 | 1 |
| Val L Fitch | Nat.Medal | 3 | 1993 | 70 | 1 |
| Albert W. Overhauser | Nat.Medal | 3 | 1994 | 69 | 1 |
| Frank Press | Nat.Medal | 3 | 1994 | 70 | 1 |
| Hans G. Dehmelt | Nat.Medal | 3 | 1995 | 73 | 1 |
| Peter Goldreich | Nat.Medal | 3 | 1995 | 56 | 1 |
| Wallace S. Broecker | Nat.Medal | 3 | 1996 | 65 | 1 |
| Martin Schwarzschild | Nat.Medal | 3 | 1997 | 85 | 1 |
| Marshall N. Rosenbluth | Nat.Medal | 3 | 1997 | 70 | 1 |
| George W. Wetherill | Nat.Medal | 3 | 1997 | 72 | 1 |
| Don L. Anderson | Nat.Medal | 3 | 1998 | 65 | 1 |
| John N. Bahcall | Nat.Medal | 3 | 1998 | 64 | 1 |
| James W. Cronin | Nat.Medal | 3 | 1999 | 68 | 1 |
| Leo P. Kadanoff | Nat.Medal | 3 | 1999 | 62 | 1 |
| Jeremiah P. Ostriker | Nat.Medal | 3 | 2000 | 63 | 1 |
| **Name** | **Prize** | **AwardType** | **AwardYear** | **AgeAwarded** | **EarlyLate** |
| Gilbert F. White | Nat.Medal | 3 | 2000 | 89 | 1 |
| Willis E. Lamb, Jr. | Nat.Medal | 3 | 2000 | 87 | 1 |
| Marvin L. Cohen | Nat.Medal | 3 | 2001 | 66 | 1 |
| Raymond Davis | Nat.Medal | 3 | 2001 | 87 | 1 |
| Charles D. Keeling | Nat.Medal | 3 | 2001 | 73 | 1 |
| Edward Witten | Nat.Medal | 3 | 2002 | 51 | 0 |
| Jason W. Morgan | Nat.Medal | 3 | 2002 | 67 | 1 |
| Richard L. Garwin | Nat.Medal | 3 | 2002 | 74 | 1 |
| Riccardo Giacconi | Nat.Medal | 3 | 2003 | 72 | 1 |
| Brent G. Dalrymple | Nat.Medal | 3 | 2003 | 66 | 1 |
| Robert N. Clayton | Nat.Medal | 3 | 2004 | 74 | 1 |
| Lonnie G. Thompson | Nat.Medal | 3 | 2005 | 57 | 0 |
| Ralph A. Alpher | Nat.Medal | 3 | 2005 | 84 | 1 |

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|---|---|---|---|---|---|
| Daniel Kleppner | Nat.Medal | 3 | 2006 | 74 | 1 |
| Charles P. Slichter | Nat.Medal | 3 | 2007 | 83 | 1 |
| James E. Gunn | Nat.Medal | 3 | 2008 | 85 | 1 |
| Berni Alder | Nat.Medal | 3 | 2008 | 83 | 1 |
| Warren Washington | Nat.Medal | 3 | 2009 | 73 | 1 |
| Yakir Aharonov | Nat.Medal | 3 | 2009 | 77 | 1 |
| Sylvester J. Gates, Jr. | Nat.Medal | 3 | 2011 | 61 | 1 |
| Sindey D. Drell | Nat.Medal | 3 | 2011 | 85 | 1 |
| Burton Richter | Nat.Medal | 3 | 2012 | 81 | 1 |
| Sean C. Solomon | Nat.Medal | 3 | 2012 | 67 | 1 |

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# BIOGRAPHICAL INFORMATION

Andrew Barbee received his Bachelor of Arts in Bible from Dallas Christian College, earned his Master's Degree in Education from Dallas Baptist University and a superintendent certification from the University of Texas at Arlington. Also, he completed a Doctor of Philosophy in Educational Leadership and Policy Studies at UTA. He is also a court-appointed mediator, and has served in private, charter, and public education as an administrator at Head Start, pre-kindergarten, elementary, junior high, high school campuses, and district offices. In addition, he is an instructor and subject matter expert at a university. He currently resides in Texas with his wife. He is interested in defending the rights of the poor and needy. Andrew enjoys learning, spending time with family, studying Hebrew, and the Jewish culture as it relates to the Bible.