2014

Intel ISEF Special Award Winners

INTEL ISEF
CERN Special Award Winners 2014

Award winners profiles:

Pictures' credit: Society for Science and the Public (SSP)

Last: **Brchnelova**
First: **Michaela**
Country: Slovakia
Age: 17

Project: On Tycho Supernova Remnant Accelerating Cosmic-rays

Young supernova remnants (YSNRs) are possible sites of cosmic-ray (CR) acceleration, thanks to which the CRs were observed to reach energies as high as 10e15 eV. However, such acceleration can be achieved only if the magnetic fields of these YSNRs were amplified. This process of magnetic field amplification (MFA) has been theoretically described by Bell&Lucek (2001), but has never been proven to be really taking place in remnants. In my work, I analyze thin filaments at the edges of Tycho SNR. There are generally two ways how such filaments could have been formed – thanks to the MFA or thanks to a locally damped magnetic field (MFD). Using formulae of the CR precursor length for both the MFA and the MFD, I derive the dependency of the filament thickness on the SNR's forward shock speed and use this relationship to demonstrate that the filaments are formed due to the MFA. Hence, it is proven that the magnetic field of Tycho is indeed amplified. The MFA nature is then also confirmed by a detailed analysis of the filaments' intensity profiles in both radio and X-ray. Spectral analysis is made in order to find out a value of the forward shock's electron density, and afterwards, the rate of the MFA is calculated. I found that Tycho's magnetic field is amplified to 300(+/-20)uG downstream and that the CRs can achieve energies up to 0.58(+/-0.6)x10e15eV. Therefore, it is demonstrated that Tycho really is a site of the CR acceleration. These values are then used as a new method to specify the still uncertain distance of Tycho SNR, which is found to be 3.1(+/-0.2)kpc.

Motivation

I have always been amazed by the physics CERN does,
from searching for the estimates on the Higgs boson mass,
to unveiling the miracles nature's decided to cover,
for which we now can only use the CERN's enormous power.
When I was 8, physics I happened to meet,
and I started to ask and I started to read,
and suddenly, as I saw what all can be found,
just using the mind and a physical ground,
I got fascinated by everything I owe,
and all about particles I just wanted to know.
For the first time in my life I begun to do science,
revealing the nature's beauty with physics rules compliance.
In the relationship with Tycho SNR I fell,
which has now been for three years going really well.
And even after those years my dedication stays,
for particle acceleration or for cosmic-rays,
and that is why the famous CERN I also want to see,
it's something that would teach, support and inspire me.

Other Prize(s) won at the ISEF fair this year:

- *Coalition for Plasma Science (CPS) – First Award of $1,500*

Last: **Goldstein**
First: **Isabelle**
Country: USA
Age: 17

Project: Partitioning Gamma-Ray Sources in Fermi Large Area Telescope Observations for Spatial and Spectral Analysis

The Weakly Interacting Massive Particle (WIMP) theory for dark matter predicts the production of gamma radiation from WIMP annihilation and decay. To examine the possibility of WIMP dark matter, gamma ray sources from M31 are partitioned from the Fermi Gamma-ray Space Telescope from the LAT instrument with 5 years of clean and ultraclean cut-data in the 1 – 300 GeV range. Background, halo, and point source distributions are then used in a spectral and spatial analysis. The spectrum is well described by a power law, but the polar averaged radial density is a good fit with a line of sight integral of the linear and squared Navarro - Frenk - White (NFW) density profile with an $R^2 = 0.9992$. The NFW fit also exhibits a significantly larger contribution coefficient from decay processes than annihilation. The correlation between theory and predictions suggests that either WIMPs are the source of the radiation, astrophysical processes are influenced by dark matter that follows this density fall off, or astrophysical processes follow this profile randomly. These findings raise fundamental questions on the origin of galactic halo gamma rays, and warrants continued research in the field.

Motivation

For the past three years I've been investigating the possibility of particle dark matter. To put it in perspective, that is seventeen percent of my life. I have found that the gamma ray halo of the Andromeda galaxy is consistent with what would be expected of decaying particle dark matter; but the weakness of a smoking gun signal, if it exists at all, suggests that the future of direct detection lies in particle accelerators. That is just one reason I am so fascinated with the LHC. Particle physics is an amazing field, and the LHC is truly at the forefront of research. With the upgrades underway, my visit would allow me see how the facilities are being improved, and I would love the chance to talk with a researcher on the search for supersymmetric particles. CERN will soon be ready to search for a whole new pantheon of particles, and visiting their labs would be the trip of a lifetime.

Other Prize(s) won at the ISEF fair this year:

- *Ashtavadhani Vidwan Ambati Subbaraya Chetty Foundation - Second Award of $500 U.S. savings bond*

Last: **Hang**
First: **William C.**
Country: USA
Age: 16

Project: Semantic Multilayer SVM: Novel Artificial Intelligence and Computer Vision Applied to Prostate Cancer Grading and Breast Cancer Diagnosis

We present Semantic Multilayer Support Vector Machine (SMLSVM), a novel prototype for artificial intelligence that uses a multilayer network of Support Vector Machines (SVM) to perform data abstraction. This capability allows SMLSVM to avoid the semantic gap and the curse of dimensionality by translating groups of related low-level data into valuable high-level concepts. SMLSVM avoids two major problems that plague current SVM technology and presents novel contributions to machine learning and deep learning. To demonstrate its real world significance, we train SMLSVM to perform Gleason Grading, the diagnosis of prostate cancer severity. To accomplish this, we develop Procist, a tissue analysis software that can intelligently and numerically describe the appearance of a prostate histology image. Procist and SMLSVM work as a seasoned digital pathologist to autonomously diagnose prostate cancers based on two Gleason Grades, a notable advance over current software that only considers a single Gleason Grade, which is clinically unrealistic. Procist presents new contributions to computer aided diagnosis and advances computational histopathology research towards achieving clinically realistic outcomes. After testing SMLSVM and Procist on 20 prostate cancer histologies from the Johns Hopkins Medical Institute and SMLSVM on the University of Wisconsin Breast Cancer Dataset, our algorithms diagnosed cancers more accurately than current approaches by 5% and 0.72%. On the prostate histologies, we achieved 100% accuracy with the two Gleason Grade innovation. We will expand the capabilities of our algorithms by adapting them to breast, colon, and renal cancers, and test our algorithms on larger and more clinically realistic image datasets to definitively validate our results.

Motivation

At the immature age of 9, I wanted to learn to hack into computers and cause mischief. We had programming books lying around the house, so I decided to start reading. When I flipped to the first page, I saw computers diagnosing breast cancer. I saw children in developing nations learn for the first time from a computer. I saw computers guiding rovers on Mars. From that first page, I realized how computers were improving our world, and I wanted more than anything to be a part of it. It was a lot to handle for a 9-year-old. I didn't want to hack anymore. I've since immersed myself in artificial intelligence for big data, and I believe that my machine learning research could be instrumental to CERN. Intelligent methods for LHC proton collision data and distributed computing may generate conclusions that allow a greater understanding of the universe. I hope to connect with brilliant people at CERN, and I am more than excited to be considered for this life-changing experience.

Other Prize(s) won at the ISEF fair this year:

- *University of the Sciences in Philadelphia - Tuition Scholarship of $15,000 per year for four years.*
- *Association for the Advancement of Artificial Intelligence - Second Award of $1,000*

Last: **Jiang**
First: **Allen**
Country: USA
Age: 16

Project: Spectral Smartphone: Rapid Prototyping Mobile Platform Diffraction Spectrophotometry

Spectrophotometers are optical instruments which analyze substance samples using electromagnetic spectra. Traditional professional spectrophotometers have extensive applicability in physics, chemistry, biology, ecology, health, industry, and education; however, they are limited in situ due to cost, fragility, and bulk, excluding them from field and low-capital usage. The purpose of this research was to create and evaluate a proof-of-concept for mobile spectrophotometry, a novel approach to spectrophotometry: since mobile platforms are equipped with LED lamps and CCD-based sensors, they could offer much more field-appropriate and economical solutions. A diffraction grating-based design was created in 3D software for the Galaxy SIII platform and a physical model produced alongside distributable stereolithography files for universal production potential. A mobile application for spectrophotometry data capture and analysis was written for the testing model. The mobile spectrophotometer was tested using standardized solutions at several wavelengths against a calibrated Thermo Scientific SPECTRONIC Educator: a 2-tailed paired t-test found no significant difference between the two sets of measurements in most cases. Thus the mobile spectrophotometer verified the concept by achieving accurate results with instant data analysis and storage, and by offering a more economical and field-appropriate solution: a complete ABS model was over 15 times lighter and over 130 times less costly than the SPECTRONIC Educator (a low-end spectrophotometer). In addition to field usability, mobile solutions offer internet and GPS networks, enabling collaboration and large-scale GIS analyses. Mobile spectrophotometers thus offer considerable improvements for global education, research, and health.

Motivation

I must admit that stories of CERN and the LHC have captured my imagination. CERN is a multinational leader in the sciences, making huge strides in human knowledge—it is to physics as the ISS and Hubble telescope are to space exploration. An international cooperative and home to physicists, computer scientists, chemists, and many other fellow nerds working together to break ground, CERN sounds too good to be true. Who WOULDN'T want to visit the mystical place where the famous Higgs boson was confirmed? Such advances in knowledge are critical to all sectors of society; these advances, I think, will prove to be the chief advancements of our century. I hope not only to see the CERN teams on the forefront of discovery, but one day, to be an integral part of them. If allowed to visit, I will look forward to seeing the data centers, to learning about the superconducting magnet track, and to meeting the researchers themselves; hopefully, they are every bit as real as I have imagined.

Other Prize(s) won at the ISEF fair this year:

- *American Association of Physics Teachers and the American Physical Society - First Award of $1,200*

Last: **Syndergaard**
First: **Jason Kim**
Country: USA
Age: 17

Project: Nuclear Fusion Using a Pyroelectric Crystal Particle Accelerator

A particle accelerator was constructed using a pair of lithium niobate pyroelectric crystals as a power source. The crystals were arranged in a push-pull configuration to double the potential voltage. Heating and cooling the crystals generated a high voltage field which ionized the low pressure deuterium gas and the resulting deuterons were accelerated to the oppositely charge crystal. Focused electron beams, 30 keV Bremsstrahlung x-rays and fluorescent x-rays were observed. Ion beam current was estimated by using a Faraday cup and a novel ammeter consisting of a neon bulb and capacitor. Additionally, deuterons were accelerated into a deuterated lithium hydroxide target and a modest increase of neutrons indicated that deuterium-deuterium fusion was detected.

Motivation

As part of our project we studied the LHC. With the announcement of Higgs Boson confirmed at five sigma standard deviation, we were inspired to have the same statistical analysis in our project. Although we didn't reach five sigma we did get 2.23 sigma. We would really enjoy coming to CERN and learning more about particle physics. It would be helpful to talk to your scientists to learn how to improve our particle accelerator.

Last: **Mogilny**
First: **Daniel**
Country: Canada
Age: 15

Project: Twinsight: A Novel Multifactor Behavioral Analysis Algorithm for Social Media

The growing popularity of social media has made it possible for computers to easily analyze human communication to identify trends and sentiment; however, limited work has been done to analyze the behavioral patterns of individual users. Developments in this area could be very important in automatic depression detection given that 17% of Americans experience depression at some point in their life but many never seek professional help. Tw-Lexa is a novel algorithm designed to analyze Twitter profiles for symptoms of depression. The algorithm extracts a set of 81 independent features including profile information, parts of speech patterns, interactions with other users, sentiment, picture analysis, and phrase mood connotation. These features vary in format from numerical values, to lists, to entire language models. Once the features are extracted for a group of users, the algorithm then calculates a similarity score between each pair of users for every independent factor. An Artificial Neural Network model is applied on the principal components of the normalized score matrices to separate depressed and happy (opposite of depressed) people into clusters, each with its own set of latent characteristics. In the experimental design, the algorithm accurately constructed clusters of depressed and happy people misclassifying only 2% (assigning them into clusters with opposites). This supported the initial assumption that data from people's Twitter profiles contains information that can be used to identify various types of depression. This algorithm integrated in Twitter could not only be used to detect early signs of depression in people but also analyze for various other behavioral traits allowing for applications in marketing, recruitment, socio-politics, and finance.

Motivation

There are many why reasons why I would really like to get a chance to visit CERN. CERN has always very inspirational for me as it is a place where scientists across Europe come together and collaborate to develop staggering innovations. I have also been following one of the CERN's greatest projects, the LHC ever since I was eleven years old. I remember in 2012 I was staying at an overnight camp when one day I received an Economist magazine that had the discovery of the Higgs-Boson right on the front cover. For the next week that was probably the only thing I ever talked about. As CERN is one of the most prestigious research centers, I would also be very interested in performing research there myself in the future and a chance to go on this trip could really allow me to get a first-hand experience of CERN's atmosphere and imagine myself part of it. In all honesty, this experience will truly be life changing for me and it would be something that will stay with me for the rest of my life.

Last: **Rusak**
First: **Gili**
Country: USA
Age: 17

Project: Come Code with Codester: A Novel Educational App that Teaches Computer Science

Despite the recent growth of software-based technologies, educating students in computer science (CS) remains a challenge. In the next decade, there is expected to be 1 million more tech jobs than CS majors. Studies show that individuals who have a K-6 exposure to computing become more adept programmers. Unfortunately, today, less than 10% of elementary school students are exposed to the discipline. Additionally, there is a lack of appropriate CS education programs for this age group since most tools are aimed at older learners. Thus, I developed Codester, a novel CS teaching tool, that teaches elementary school users the fundamentals of computer science. My system is one of the first Android apps for this purpose and is unique since it allows for rapid, self-guided learning and utilizes the accessible, inviting mobile platform of a smartphone or tablet. Students develop code prompts using the special visual programming language of Codester, made up of arrows and symbols to appeal to the young target audience. Through using the app, users learn sequencing, code reuse, iteration, decision-making, efficiency, and problem solving. The multiple user studies of grades 1-8 that I conducted quantify the effectiveness of this app. In only four sessions, users improved in all coding concepts that Codester teaches. For example, 40% more students understood the concept of code reuse after using the app. Eighty percent of students reflected that they preferred the mobile platform over the laptop medium because they are familiar with the mobile technology. Boys and girls alike engaged with Codester. This app empowers young students and advances their CS knowledge, preparing them to tackle future, global technological challenges.

Motivation

"When we collide two protons at very high speeds, we record a massive amount of time stamped particles," Dr. Bellis, my professor explained. "Thus, we need to find the patterns in the particles: we must connect the dots," I concluded. The solution: computer science. Last year, I "connected the dots" between Twitter teenagers and discovered their novel properties. My current app, Codester, empowers young students to do the same: learn to write code. I developed an efficient, new programming language for novice users. This summer, I plan to work with Dr. Bellis to develop a collaborative app that will expose young users to simple versions of CERN-style time-stamped data and allow them to identify patterns. This will breed new ideas for developing computer algorithms and might add to our vast ability to discern patterns in real data. Visiting CERN will allow me to visualize the data that I will be working with and interact with colleagues and scientists to develop an effective tool.

Other Prize(s) won at the ISEF fair this year:

- *Intel® Open Source Technology Center - Honorable Mention of $500*
- *Association for Computing Machinery - First Award of $1,000*

Last: **Sandbakken**
First: **Tucker John**
Country: USA
Age: 17

Project: Nuclear Fusion Using a Pyroelectric Crystal Particle Accelerator

A particle accelerator was constructed using a pair of lithium niobate pyroelectric crystals as a power source. The crystals were arranged in a push-pull configuration to double the potential voltage. Heating and cooling the crystals generated a high voltage field which ionized the low pressure deuterium gas and the resulting deuterons were accelerated to the oppositely charge crystal. Focused electron beams, 30 keV Bremsstrahlung x-rays and fluorescent x-rays were observed. Ion beam current was estimated by using a Faraday cup and a novel ammeter consisting of a neon bulb and capacitor. Additionally, deuterons were accelerated into a deuterated lithium hydroxide target and a modest increase of neutrons indicated that deuterium-deuterium fusion was detected.

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Last: **Srinivasan**
First: **Anand**
Country: USA
Age: 17

Project: RNNScan: Eukaryotic Gene Finding via Hybrid Recurrent Neural Networks

Today's vast reserves of genetic data necessitates a computational tool which is capable of automatically predicting boundaries of protein-coding regions in the genome. In eukaryotic sequences, this remains an open problem due to gene interruption by non-coding introns. Popular probabilistic tools such as GENSCAN employ Hidden Markov models, but cannot take into account the locality of genetic signals which describe the initiation or termination sites of coding sequences – an automatic segmentation task made difficult by erratically distributed intergenic sequences. We propose a recurrent-neural-network based tool, RNNScan, which incorporates specialized "memory units" to force gradient retention, as well as a gated information-flow architecture to allow convergence on terminal gene boundaries following arbitrary-length noncoding sequences. A novel "sluice gate" unit regulates error flow between memory blocks. The network is "hybridized" with an auxiliary probabilistic feature, which is a function of differences in information content (relative entropy) between regions of the genome. These features, called the nucleotide scores, are computed over a linear Bayesian model and marginalized via a custom message-passing algorithm. This takes into account the influence of certain k-mer distributions around splice-sites, a known determinant of snRNP activity. On Burset and Guigo's standardized dataset of 570 vertebrate sequences, RNNScan performs on par with GENSCAN at nucleotide- and exon-level accuracy but outperforms it on the exact whole-gene identification test (71% vs. 43% sensitivity). We show how RNNScan is able to achieve this performance by solving the localization problem, and discuss applications in genome-tailed pharmaceuticals and cancer diagnostics.

Motivation

I believe that CERN is the forefront of scientific research today, bringing together myriad disciplines for the sake of seeking an answer to possibly the most profound question humankind has ever asked: the origin and composition of our universe. Historically, much of scientific research has followed a top-down paradigm, gathering evidence to explain the increasingly minute (and complex) behaviors that govern our macroscopic existence. The work being done at CERN seems to be the first large-scale foray into the truly fundamental processes that govern all others, the elemental building blocks without which we cannot build or engineer things to match the complexity of nature. As a future computer scientist I hope to be on this cutting edge, helping to further such significant questions by extending the reach of what we can learn from data. A visit to CERN would be invaluable to my understanding of what we do with these questions.

Other Prize(s) won at the ISEF fair this year:

- *United Technologies Corporation - Each winning project will receive $3,000 in shares of UTC common stock.*
- *Association for the Advancement of Artificial Intelligence - Honorable Mention*

Last: **Strauss Eggleston**
First: **Lia Grace**
Country: USA
Age: 14

Project: Time and Radiation Domain in Star-Like Objects: Relating Intrinsic Colors of Quasars to Redshifts

As the redshift of a quasi-stellar object (QSO) increases, the velocity and distance of the QSO increases. Based on this fact, it was hypothesized that when plotting the intrinsic colors of QSOs as a function of their redshifts, the intrinsic colors would either decrease, indicating that distant QSOs are more blue, or increase, indicating that distant QSOs are more red. I wrote a program in Python that used public data from the Sloan Digital Sky Survey with the necessary information on over eighty thousand QSOs. The program separated out sections of data with four increasing redshift ranges that would approximate the rest frame color u-g intrinsically. The program then calculated the error-weighted average of the u-g magnitude in each range. When I plotted this data, I discovered that the rest frame u-g magnitude generally decreased as redshift increased, confirming the first part of my hypothesis. The data therefore indicate that QSOs are more blue at higher redshifts. This information helps us to understand more about the universe as it was when it was younger. In conclusion, the data are consistent with the idea that earlier in the universe, there were more collisions between galaxies, causing QSO formation. For this reason, the QSOs from earlier epochs have more energy and are more blue. As the universe expands, there are less frequent collisions, so the QSOs produced are more red. This study contributes to models of the younger universe and how an expanding universe has affected the formation of QSOs.

Motivation

I'm in love with the world of astrophysics, and pretty much all the topics I want to research and information I want to gain about the universe comes down to understanding particle physics. A visit to CERN would be amazing to me for so many reasons: seeing just how much it takes to create precise experiments on miniscule particles, learning more about the mysterious Higgs Boson and what it really means. I'm fascinated by the engineering of the LHC and how it really works as well. I would enjoy an opportunity to visit CERN because there's so much knowledge I would gain from it and there's so much wonder in the futuristic promise of what happens there.

Last: **Tramontano**
First: **Jared Anthony**
Country: USA
Age: 15

Project: On the Theory of Lures with Dynamical Action on Compact Topological Manifolds and Ordinary Hyperreal Fractal StringsIlluminaMed: Developing New Artificial Intelligence Techniques for the Use In a Biomedical Image Analysis Toolkit

In this project, we provide a new notion of a topological homeomorphism by defining such in terms of a dynamical system. That is, we want to construct a time-dependent quasi-attractor and a time-dependent basin of attraction that respects the homotopy equivalence class of some compact topological manifold by acting on some portion of the manifolds boundary, whilst altering the Minkowski Content. We were able to properly provide a new notion of a topological homeomorphism in terms of a dynamical system, namely a "lure". This definition is constructed for general n-dimensions. We are able to show that, with respect to the monoid of positive time under addition, a set M denoting the homotopy equivalence class of a manifold, and the "lure", this system satisfies the axioms of a dynamical system. However, we are able to generalize this notion beyond that of compact topological manifolds, to ordinary hyperreal fractal strings. That is, the natural hyperreal extension of an ordinary fractal string, the first appearance of such an object. In future work, we would like to apply the general idea of a "lure" to practical applications in economic systems, biological systems, and certain machine learning algorithms.

Motivation

Curiosity. This curiosity has been an integral part of my life for as long as I can recall. I've always felt that this innate curiosity has been stymied in the classroom, so I've spent my life seeking out other mediums of learning. When I was 11 years old, I found myself growing more curious about the mathematical principles that govern nature. So, to satiate my desires, I decided to email Leonard Susskind of Stanford, a major name in string theory, to ask him what the best way was to go about learning physics and mathematics. Much to my surprise, he eagerly responded with inspiring words of wisdom and lecture notes on Statistical Mechanics, Quantum Field Theory, and Quantum Mechanics. I was hooked. I once attended a talk by Nobel Laureate, Doug Osheroff. He said physics is the act of "tricking nature into revealing her secrets to mankind". My curiosity leads me to want to see the invention responsible for tricking nature into giving up some of its best-kept secrets of nature, CERN.

Last: **Yamanaka**
First: **Mie**
Country: Japan
Age: 17

Project: Development of Highly Efficient and Stable Dye-sensitized Solar Cells Using Natural Hydrangea macrophylla Dyes

Three years have passed since the Great East Japan Earthquake. In light of the nuclear power plant accident that occurred in its aftermath, the importance of developing environmentally benign energy sources, such as dye-sensitized solar cells (DSSCs) that use natural dyes extracted from plants, has come to be recognized as a significant component of the reconstruction effort. However, conventional DSSC uses natural red or yellow dyes which have low associated conversion efficiencies (CE) (< 0.3%) and the dyes degrade easily. In this study, sepals of Hydrangea macrophylla, which have various colors (red, blue and violet) depending on the concentration of complex containing Al ions, were used for DSSC. Previously, this type of dye was not considered for use in DSSCs. The samples were prepared under four distinct conditions: dry and fresh treatment, and both with and without ultrasonic-irradiation. The highest electromotive force, i.e. CE = 2.46%, was observed in a DSSC produced using dye extracted from blue sepals dried at 60°C under reduced pressure. Compared with the previous work, this value has the highest CE of the DSSC group that uses natural dyes. To evaluate the dye degradation, the stability of the electromotive force produced by DSSC using dyes extracted from sepals with and without ultrasonic-irradiation was compared. The results showed that the blue dye was more stable than other dyes, because the former forms a stable Al ion chelate complex under ambient conditions. In addition, the ultrasonic-irradiated dyes produced a stable and long-duration electromotive force. Thus, DSSCs produced using natural dyes of hydrangea with high CE and stability are well suited for practical DSSC applications in the future.

Motivation

My hometown Tohoku, is a sight proposed for International Linear Collider (ILC). I had a chance to represent high school students in Japan to present my opinion at the Symposium of ILC held at University of Tokyo (http://newsline.linearcollider.org/2013/10/24/explaining-the-ilc-in-an-easy-to-understand-way/).

At the symposium, I met with Dr. Lyn Evans, the project leader of the CERN and Dr. Mike Harrison, the Associate Director for the International Linear Collider in the Linear Collider Collaboration, and heard about CERN directly from them. I think meeting with them and going to CERN was a predestined encounter. ILC has hope for my hometown after the earthquake. Also, the research done at CERN which enables to investigate the mechanism of solar energy has in intimate relation with my solar cell research. I strongly feel that I must go to CERN and see what it is like to have super-high-speed accelerator for my hometown and Japan, and also to further the development of my research.

Other Prize(s) won at the ISEF fair this year:

- *American Chemical Society - Certificate of Honorable Mention*