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# STELLAR'S JOURNEY: FROM CONCEPTION TO PROTOTYPING OF THE FINALIST OF AN INTERNATIONAL DESIGN COMPETITION

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Prof. Bekir Kelceoglu was born in Ankara, Turkey and attended Anadolu University, where he received his B.A. in Interior Architecture. Even before his graduation, he started to work as a free-lance tutor, product designer, and interior architect. In year 2006, he received his Master of Fine Arts degree from the Ohio State University, concentrating on design development process in industrial design. His research interests are: humanitarian design, design development process, and emerging technology integration in design.

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# The Stellar's Journey: an International Design Competition Finalist, from Conception to Prototype


## Abstract

In November 2016, author of this paper named in the ten finalists out of 132 designers from 80 cities in 27 countries at a highly-prestigious international design competition. It was about designing a light fixture with the theme "Cosmic."

The initial research took place in January 2016. As a mixed-method researcher, the author started gathering data to understand what the cosmos is all about and analyzed the findings as a personal reflection and the overall synthesis of the research. No quantitative data were collected, as it is not suitable for this particular study.


## Introduction

"If you wish to make an apple pie from scratch, you must first invent the universe."

Carl Sagan

L.A.M.P. (Lighting Architecture Movement Project) is an organization that was founded by two architectural lighting enthusiasts, Annika Hagen and Nicole Fox, in 2013. It is based in Vancouver, Canada as a group installation and exhibition effort which showcases architectural lighting design. They launched their first international design competition in the same year. Since then, they attract countless designers around the world and provide opportunities to engage multidisciplinary talents in unique lighting design concepts.

L.A.M.P. grew into one of the most prestigious design competitions in lighting design. Their judging panel brings many well-established names together, mainly lighting designers and architects. They review and select finalists with predetermined theme and criteria. The theme was "cosmic" in 2016 when the Stellar was competing against 132 submissions from 80 cities in 27 countries.

The author of this paper, who is an industrial designer and educator for more than 12 years, participated in the competition as an "established designer," one of the three categories. He was selected one of the top 10 finalists in the 2016 round. This paper documents the journey and steps chronologically, like a design journal. It is hoped that sharing the knowledge and experience will help other designers with similar tasks in the future, especially for research-based creative activities.

## Methods

This study was conducted as qualitative analysis. After understanding the competition requirements and other design constraints, the author determined that quantitative or mixed research methods are not suitable for the study. Quantitative data would be too specific to translate into such creative activity; therefore, more "open-ended" data was required.

After initial secondary research activities, such as literature review and media browsing, the author interviewed with 34 volunteers and asked them to describe their understanding of the word "cosmic" via series of sketches and collages. Several of the initial drawings are shown below.

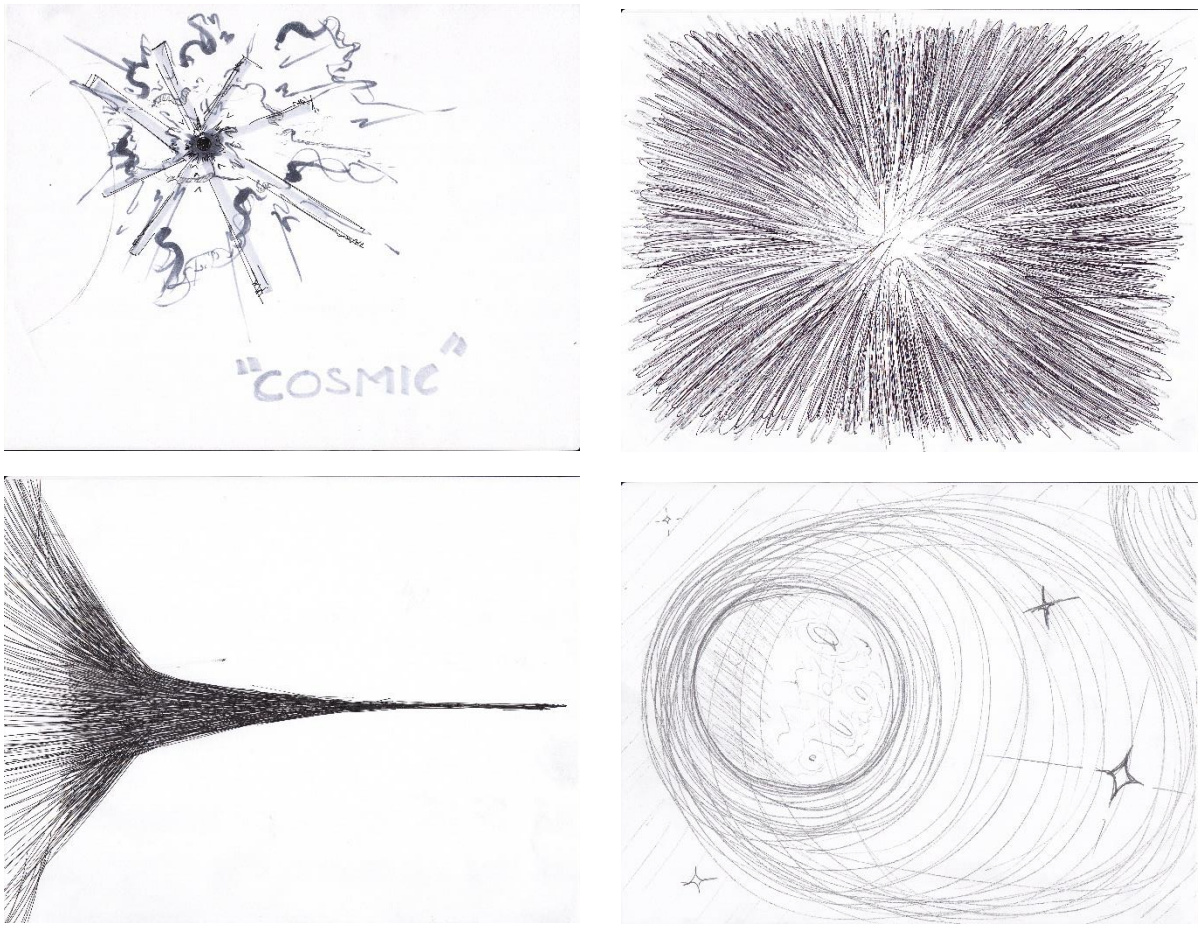


Figure 1: Concept generation sketches from participants

Interpreting qualitative data was somewhat effortless. Almost all participants emphasized the planets, stars, and other celestial bodies. When the word "light" was added to the keyword "cosmic," it was clear that the light explosion (or shining outwards) became the dominant sketch

element.  Consequently, the clear image of the light explosion was selected by the author as the dominant design feature and translated into the Stellar's final image.

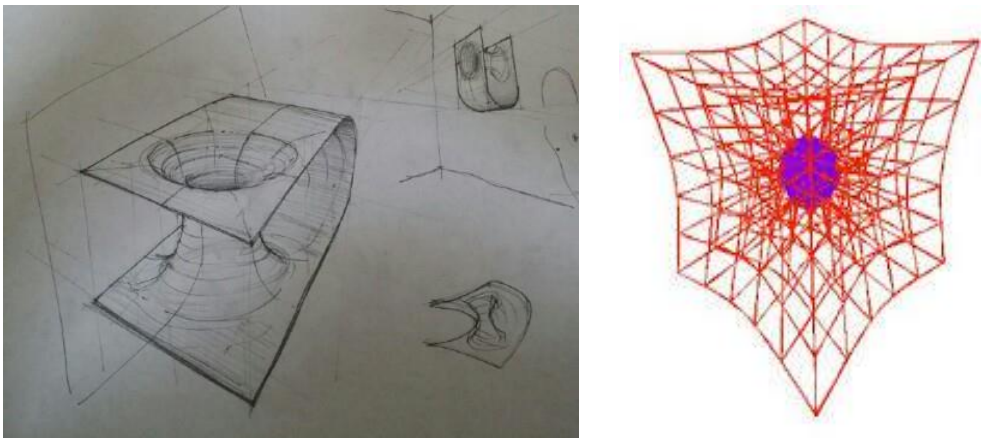

Figure 2: Concept generation sketches from the author (Time-space warp)

Upon concluding the final concept, prototyping stage started.  Since it was a linear (step-by-step) process, this paper -as well as the conference presentation- presents the prototype building method in chronological order.

Several CAD models were prepared and made available to participants at the early stages of the design development. Although the majority of the participants favored the time-space warp concept (above) earlier in the brainstorming sessions, it was interesting to see how their preferences changed after seeing the computer-generated images.

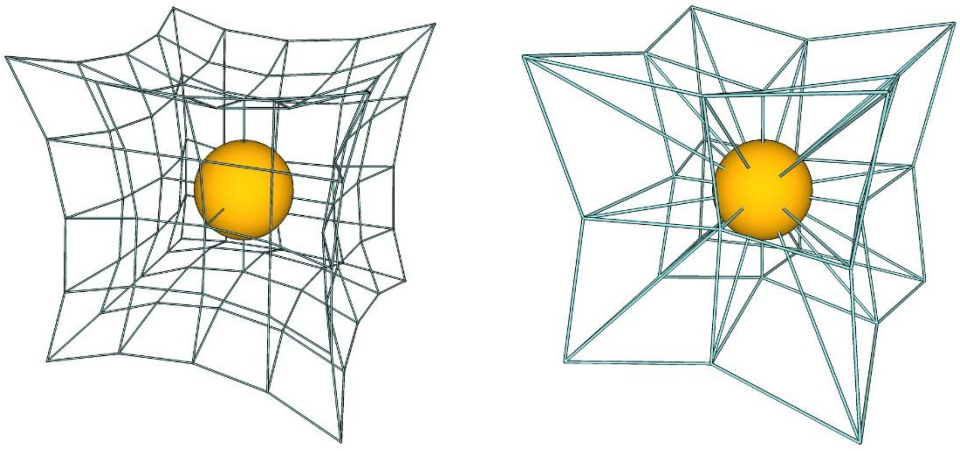

Figure 3: Early CAD concept models

After eliminating the smoother “time-space warp” concept from further development, the “light explosion” concept development took place. Final dimensions were calculated, computer renderings were generated, and presentation images were submitted for the LAMP competition.


Figure 4: Competition entry images

While waiting for the competition results, full-size paper models were prepared by using rapid prototyping technology and wooden dowels. It was the first three-dimensional representation of the Stellar. Engineering challenges and geometric construction methods were finalized before the actual prototype with real materials were made.

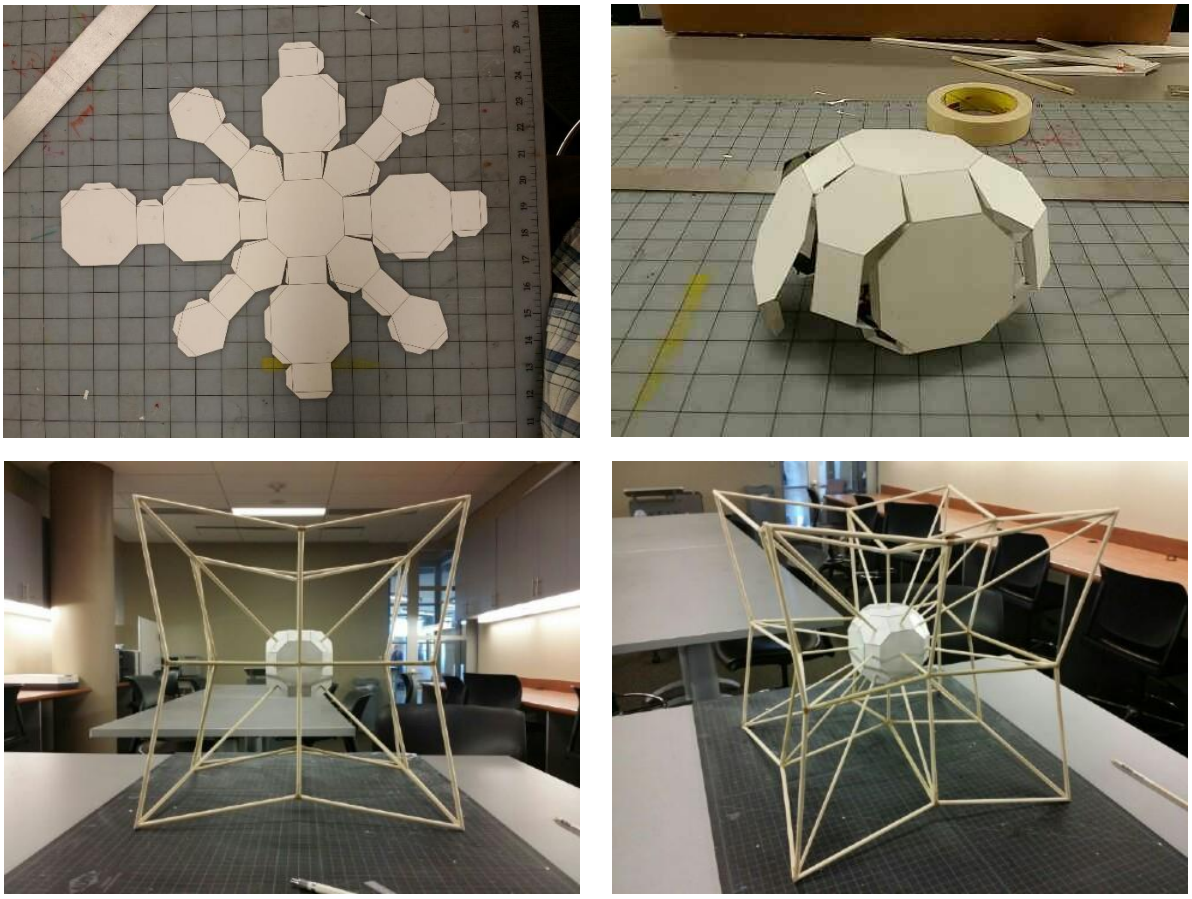

Figure 5: Paper – dowel working models

Around late September 2016, LAMP announced that the Stellar was one of the ten finalists. Consequently, the prototyping activities gained more importance and started to speed up. The Stellar was designed to use individually addressable RGB-LED technology with wireless control interface (Bluetooth). Arduino with Bluetooth shield was used to control the LED array. Due to time limitations, laser cut MDF pieces were used to hold LED array, rather than engineered PCBs.

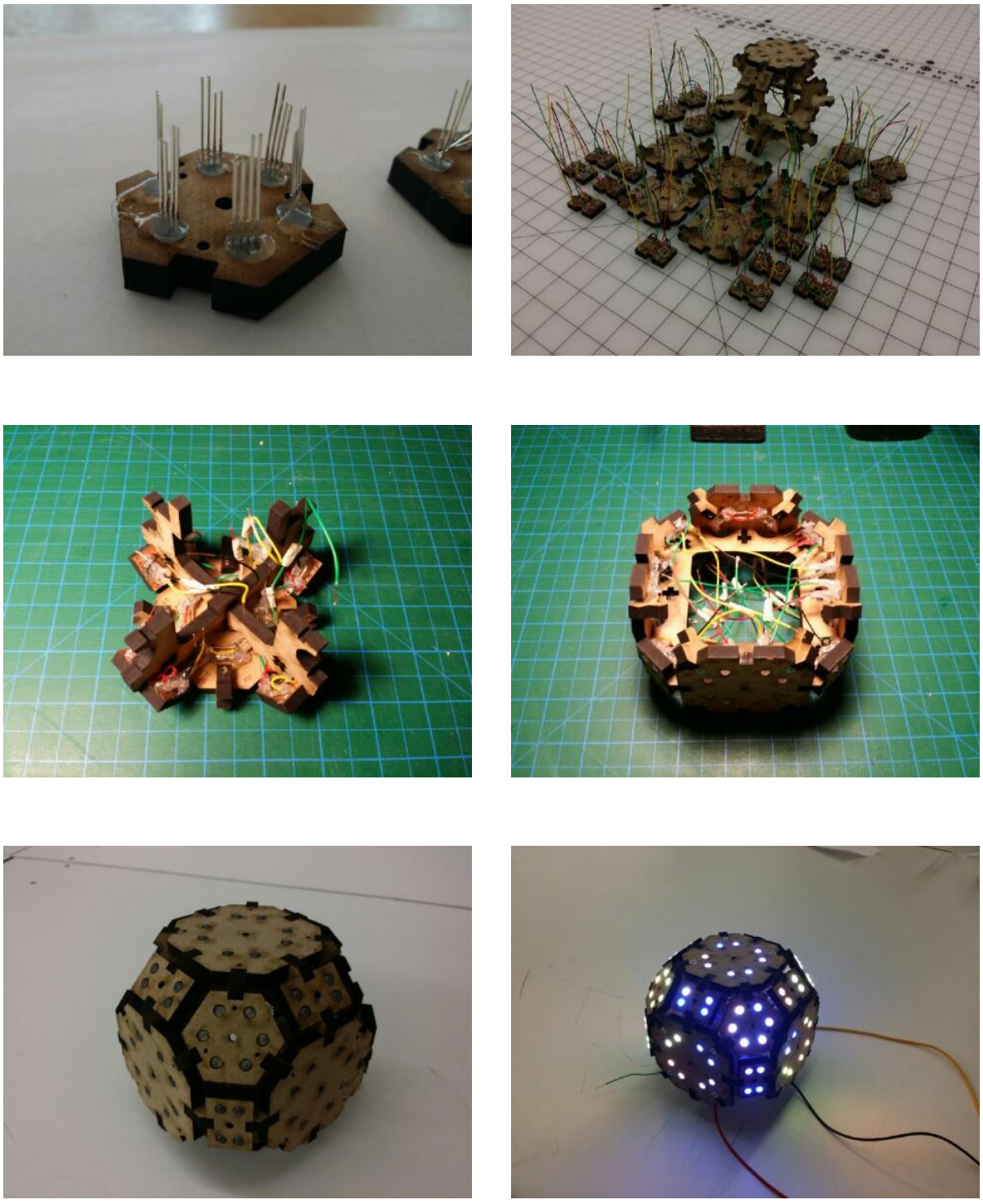

Figure 6: Light fixture development

As in all design projects, failures are the part of the process.  There were many catastrophic failures during the prototyping phase; however, learning from what went wrong and improve upon mistakes is the most useful strategy in every project.

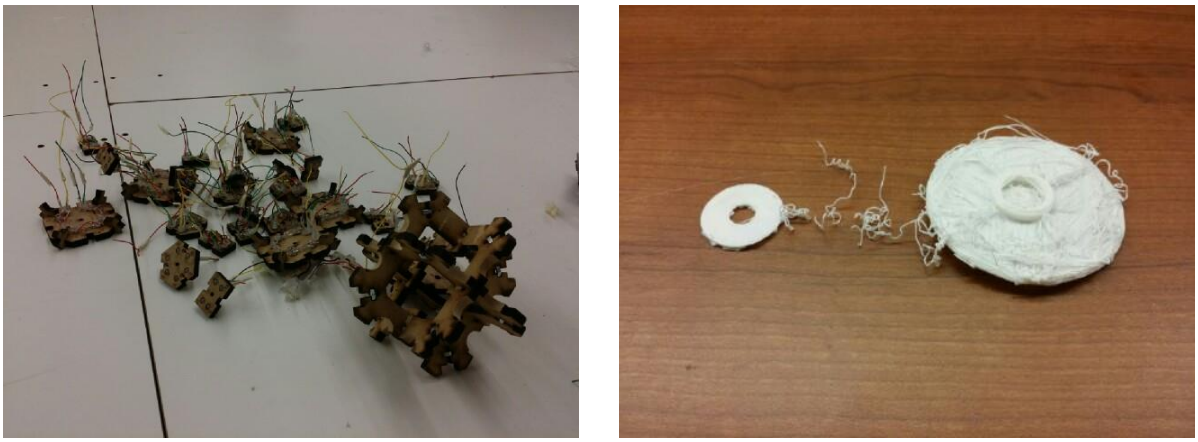

Figure 7: Failures

Once hardware and software of the light fixture are finalized, the steel frame of the Stellar was constructed.  Originally, the Stellar was designed to utilize cold bending and point welding techniques, however, due to cost and unavailability of tools, rapid prototyped (3D printed) parts were used as the connection elements.

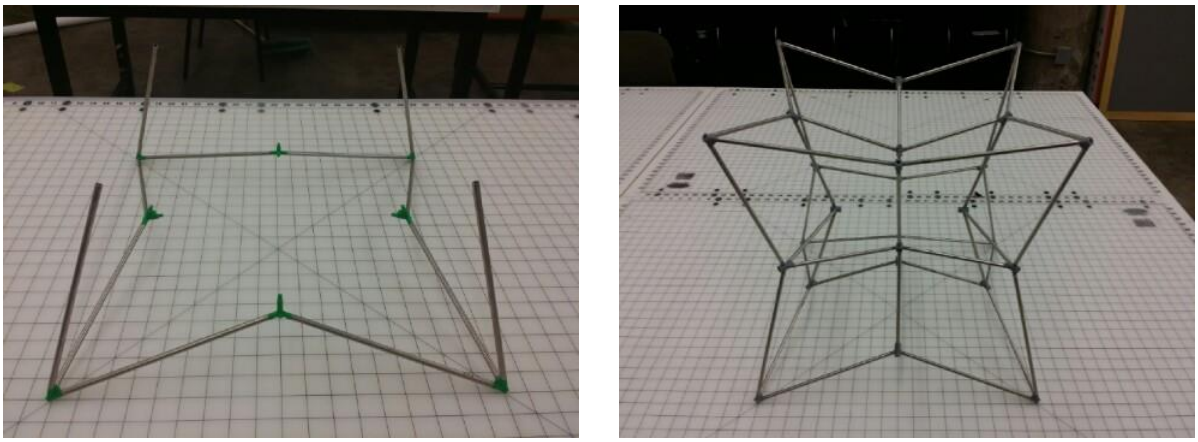

Figure 8: Steel frame construction

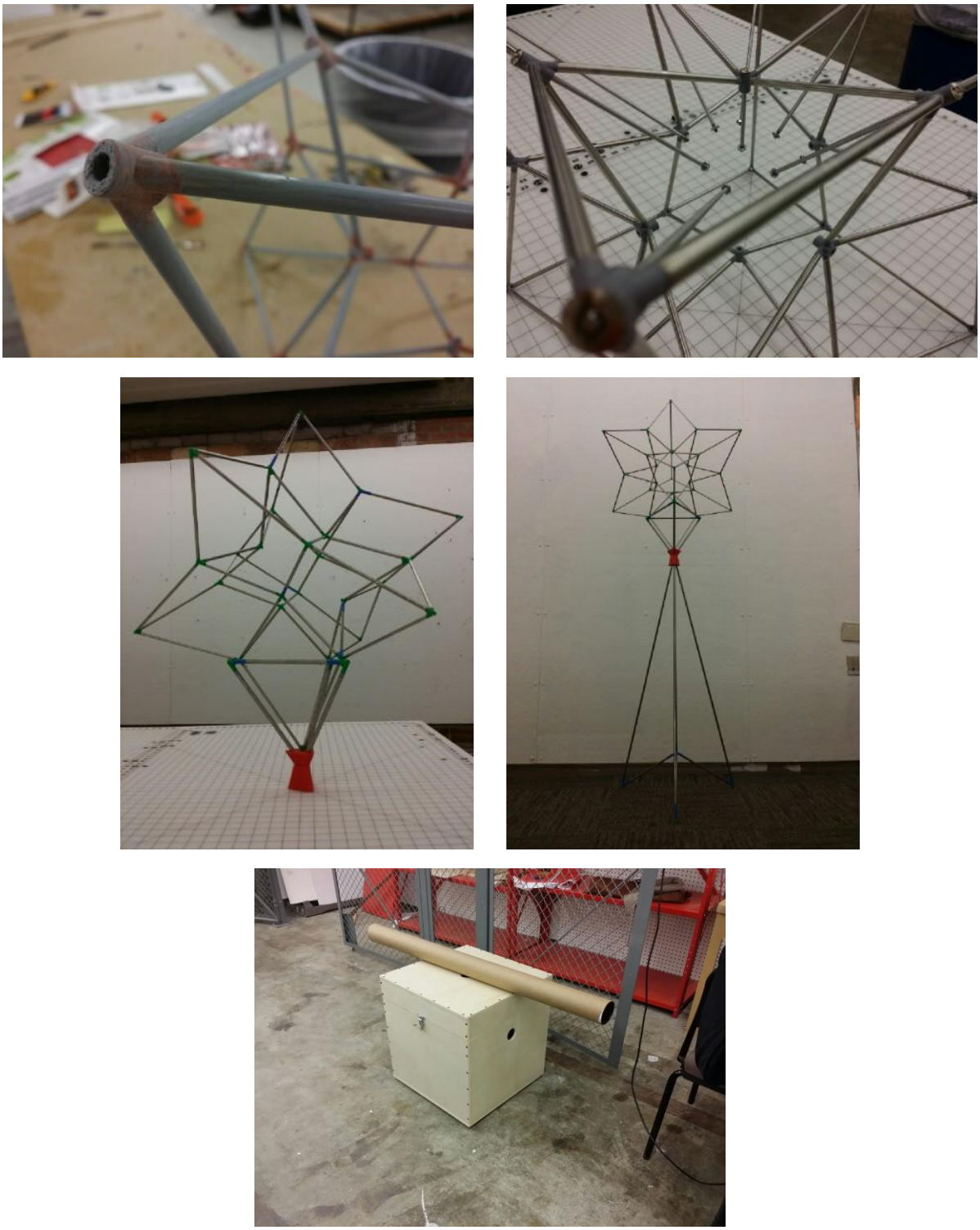

Figure 9: Finished steel frame and preparation for shipment

In November 2016, the Stellar appeared in the competition exhibition, along with other finalists.

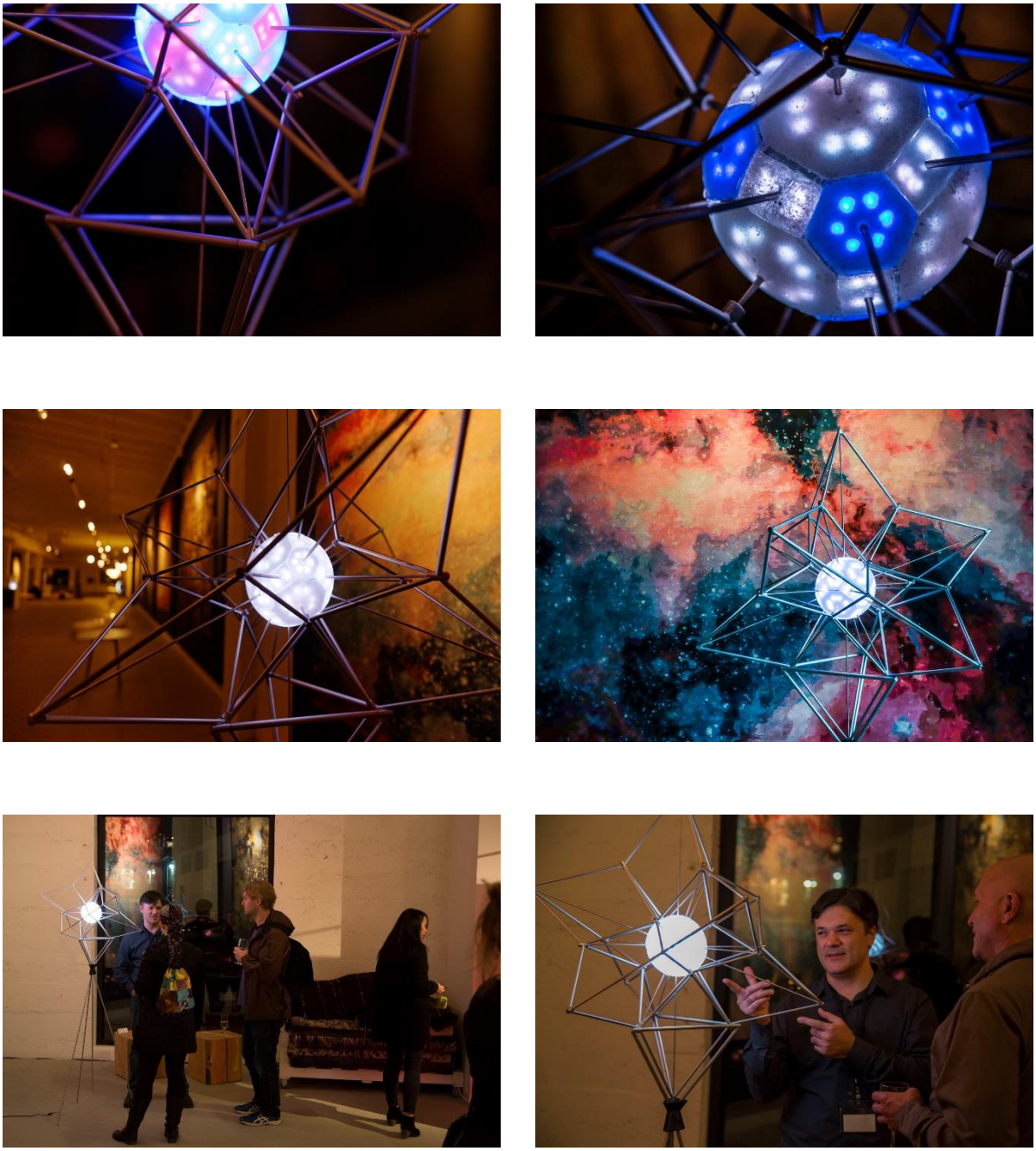

Figure 10: Exhibition night with other finalists

## Results

The Stellar was transported to Vancouver, Canada in November 2016 to participate in an exhibition. Although it was not selected as the winner of the competition, it was an excellent instrument for practicing and teaching qualitative research methodologies. The experience gained from the LAMP competition was used in an industrial design course (IND-471) later in the Spring 2017 semester in the Syracuse University's School of Design.

During the Spring 2017 semester, a total of 11 students worked on the 2018 LAMP competition. The author of this paper shared the data gathering and qualitative research methodologies with the participating students. Many of them used similar methodologies; however, individually documenting their research is beyond this paper's scope.

It should be noted here that the competition did not limit the participants to use a certain technology or illumination methods. Although many students selected to utilize LED technology (perhaps due to its low power, user-friendly, and long-life characteristics) only a few of them got curious and integrated a sensor-based microcontroller driven light fixtures. Using microcontrollers was not a requirement for the course, either. Therefore, each light fixture was unique and handled as such.

In February 2018, three of the eleven students from the IND-471 class made to the finals, out of 142 submissions from 85 cities in 28 countries. Three finalist designs are shown below. They can also be seen on the official LAMP website, www.welovelamp.ca.

Working on a real-world project with a professor who has the experience in the same competition was the main motivator for the course. Many students stated that integrating the competition into the course was beneficial for their academical growth.

Figure 11: Three Finalist Designs

**Appendix**

Following text was submitted with the winning design:

"CONCEPT STATEMENT

"If you wish to make an apple pie from scratch, you must first invent the universe…" said Carl Sagan, who is perhaps one of the most popular astrophysicists in the modern history. Understanding the meaning behind his words, I synthesized my own quote: "If you want to design a light fixture, then I need to invent the light first…" Then I traveled to the point at which all had started, the Big Bang, and found my inspiration there.

Stellar represents the origin and the birth of our universe. Like everything else, the light was born in there and ever so expending to every direction. Hard geometric angles and diverging lines enforce this great explosion.

Stellar was designed as two separate pieces so that the user can carry his/her universe anywhere he/she wishes. The smart processor inside the light globe provides many customizable options, such as color, intensity, and/or sensor integration.

PROJECT SPECS

Stellar's crown and its pedestal are made out of highly polished chrome tubes. They are attached with point-welding. The feet and the neck of the stand are solid iron providing necessary stability. The actual light fixture is a Bluetooth controlled RGB-LED system, which has a rechargeable battery. The detached crown can provide 2-4 hours of continuous light at the highest intensity. The crown can be placed at any corner to recharge it back again. (18"x18"x58")

BIO

Bekir Kelceoglu is a professor and a designer. Passionate about design and emerging technology, he has been actively teaching, researching, and designing architectural products for more than ten years. Originally from Turkey, he has bachelor's degree in interior architecture from Anadolu University, Turkey; and, Master of Fine Arts degree in industrial design development from the Ohio State University. He lives and designs in Syracuse, New York, United States of America.