EXHIBITS SPRING 2018

University of Nebraska-Lincoln
ANTRO 498/898
JOMC 491/891
GRPH 491

INTRODUCTION

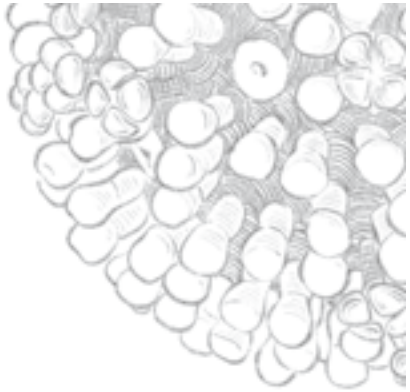
The 2018 Exhibits Project represents the work and dedication of students and faculty from the University of Nebraska-Lincoln Spring 2018 JOMC 491/891, ANTRO 498/898, GRPH491 class. This class focused on how exhibits communicate, educate, inform, and motivate audiences. The course provided hands-on experience in collaborating, designing, building and assessing an exhibit for the real-world setting at the University of Nebraska-Lincoln. The class reviewed the client's proposal, conducted content research, planned, designed, and constructed exhibit elements, installed the exhibit at its local site, and created this portfolio of the entire process.

This Spring Semester 2018 class featured the "The Original Sucrose Density Gradient Swinging Bucket Rotor" for the Nebraska Center for Virology at the Morrison Life Sciences Research Center.

ACKNOWLEDGMENTS

We would like to thank sponsors, Andrew “Andy” Jackson and Thomas “Jack” Morris, for funding the Nebraska Center for Virology exhibit, and to Susan Weller from the University of Nebraska State Museum and the Biology of Human NIH-SEPA project for supporting the course fees. We are grateful to Charles Wood, Jim Van Etten, and David Dunigan for their encouragement and support throughout. This project was made possible through the assistance of David Martin and Jerry Reif at Nebraska Innovation Studio, Aaron Sutherlen from the School of Art and Art History, Katie Krcmarik from the College of Journalism and Mass Communications, Robb Nelson from the Department of History, and Judy Diamond from the University of Nebraska State Museum.

The research, design, production and installation of the exhibit was made through the collaborative efforts of Mahra Al Raisi, Jinell Carslin, Tiah Davis-Northway, Ruth Grady, Devra Hock, Jacob Kennedy, Daisha Marquardt, Madison Mascare, Steven Petty, Daisy Sarne, Cameron Scheele, Phuc Tran, Juan Velasco, Amanda Wade and Monica Zurek.



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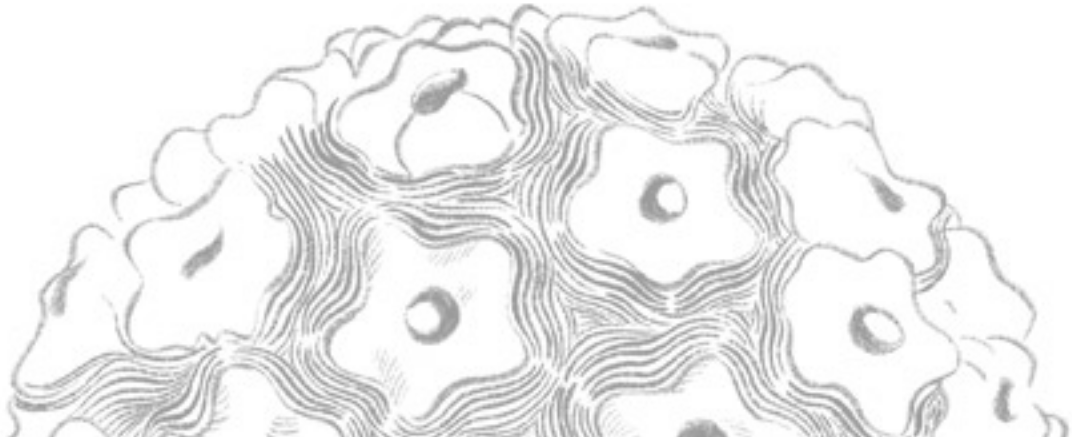


Myron Brakke and wife.

SUMMARY

The 2018 class project was “The Original Sucrose Density Gradient Swinging Bucket Rotor” in honor of Myron Brakke, the first Nebraska scientist to be inducted into the National Academy of Sciences. The exhibit and associated web site showcases Brakke’s life and work, the density gradient centrifugation technology he invented, as well as the viruses studied, and the achievements of the Nebraska Center for Virology. Density gradient centrifugation continues as a globally significant technology in molecular biology and virology.

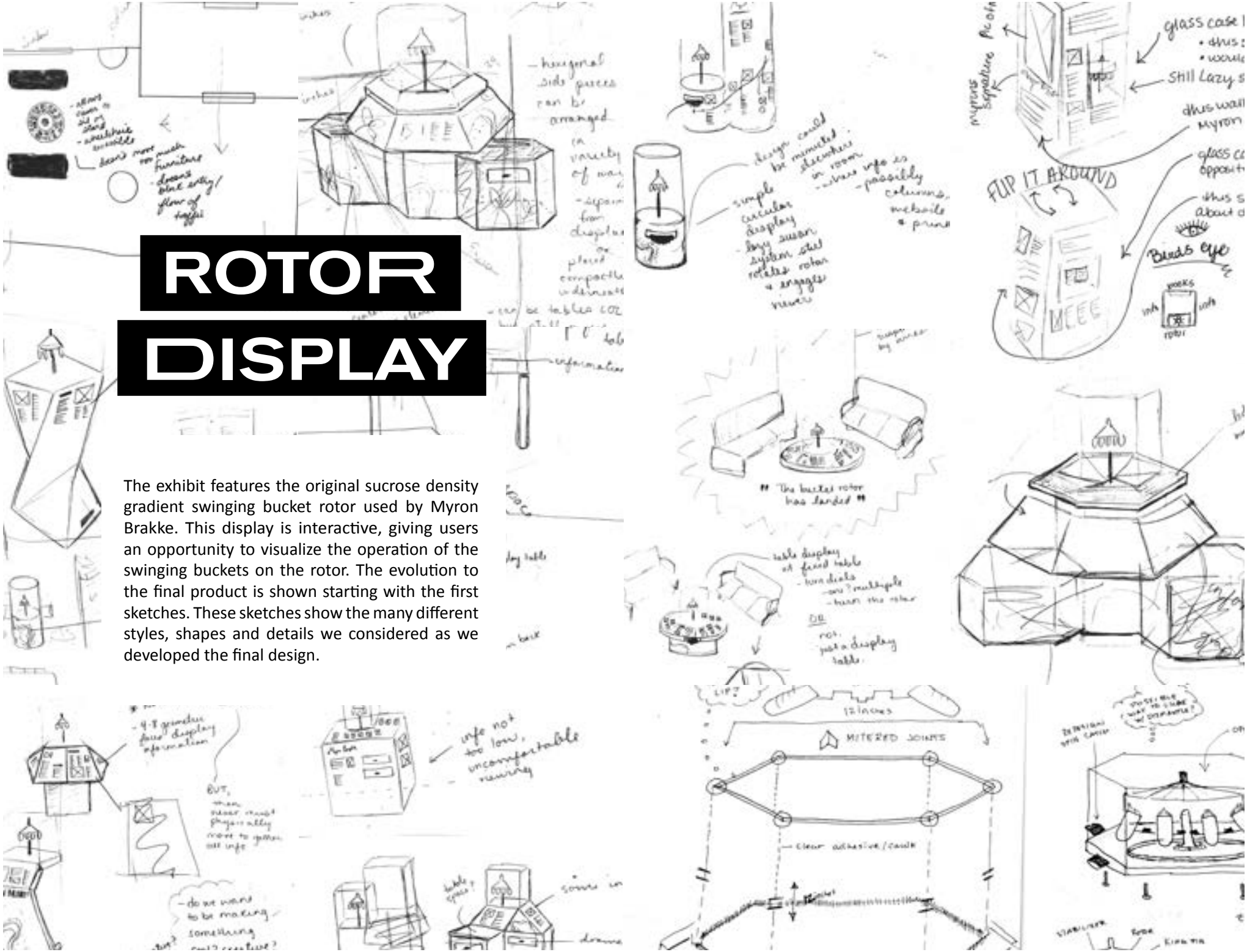
The exhibit is located in the North Atrium of the Ken Morrison Life Sciences Research Center on the University of Nebraska-Lincoln campus.

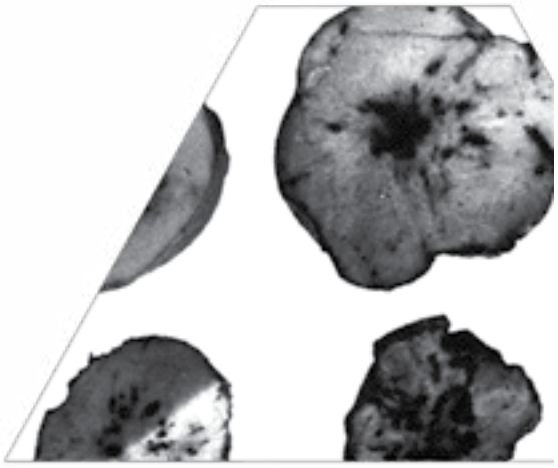
Our goals were to display the original swinging bucket rotor, present the scientific context for the development of the density gradient centrifugation technology, highlight the contributions of Myron Brakke, and represent the many achievements of the Nebraska Center of Virology. An important part of the process was our extensive research conducted to fully understand the rotor, Myron Brakke, viruses, and design solutions for displays and production materials that will work in our given space. We collaborated ideas and inspiration to begin and intermingled them throughout our process to form our final designs and exhibit.


DESIGN
PROCESS

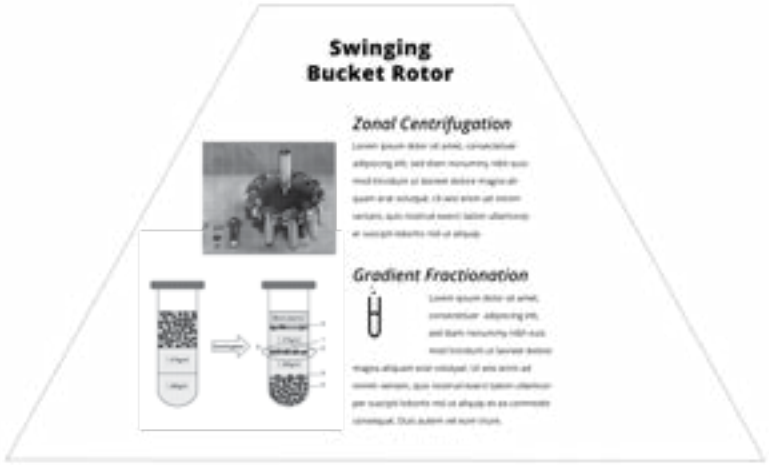
ROTOR DISPLAY

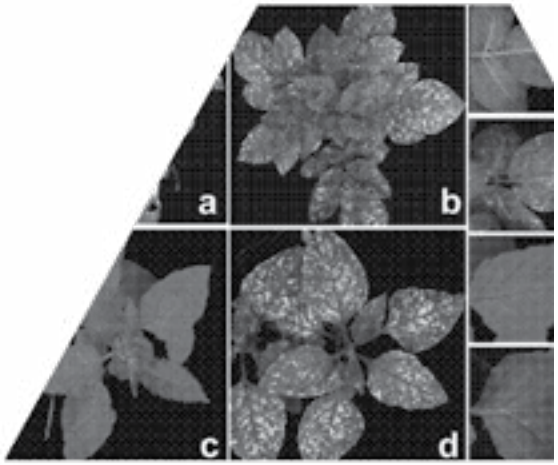
The exhibit features the original sucrose density gradient swinging bucket rotor used by Myron Brakke. This display is interactive, giving users an opportunity to visualize the operation of the swinging buckets on the rotor. The evolution to the final product is shown starting with the first sketches. These sketches show the many different styles, shapes and details we considered as we developed the final design.



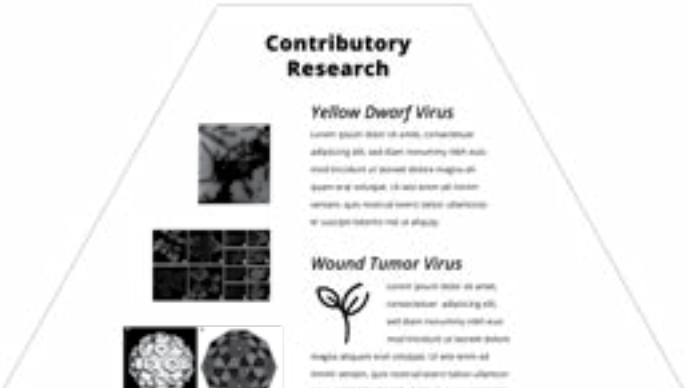


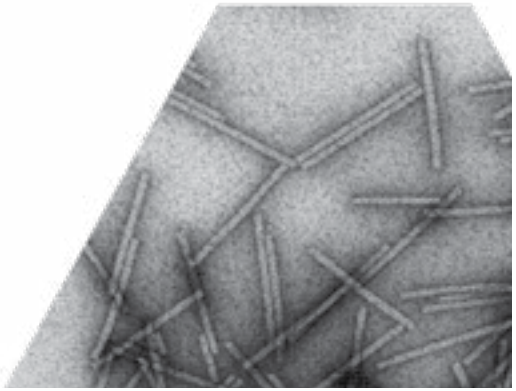
A full-scale cardboard working prototype was created to understand and visualize the structural characteristics, functionality and configurations of the pieces.



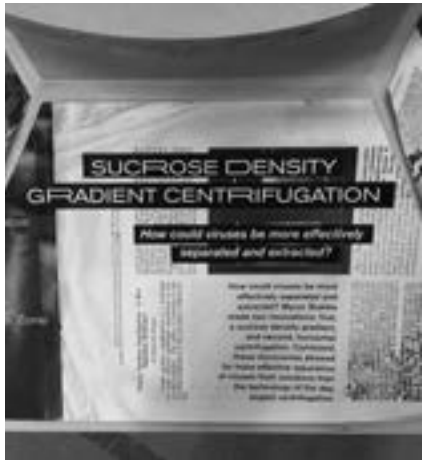


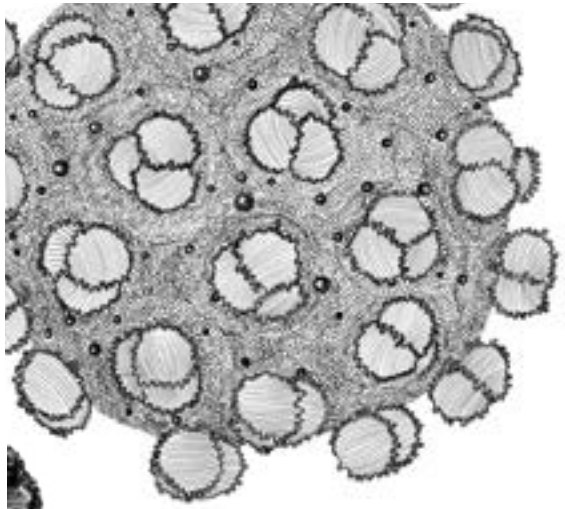
The graphic panels on the rotor exhibit creatively highlight who Myron Brakke was as a person, his achievements, and the significance of his invention of sucrose density gradient centrifugation.





The panel pieces were produced with 2mm thick foam PVC and cut into trapezoids.





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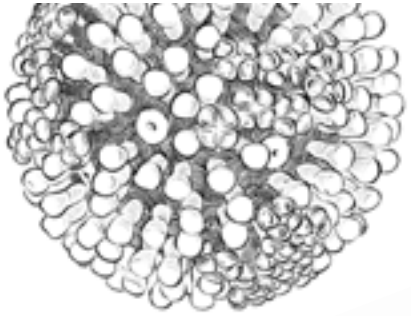

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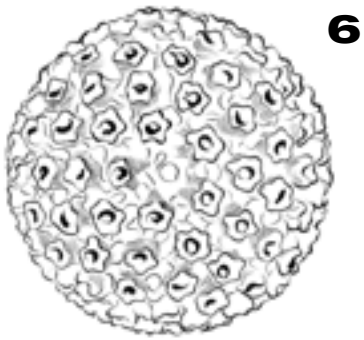

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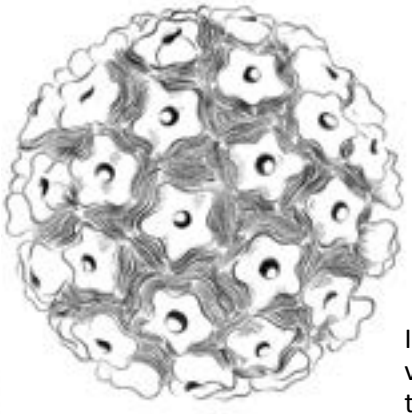

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VIRUS ILLUSTRATIONS

Illustrations depict the various viruses that are researched at the Nebraska Center of Virology.

1 *Paramecium bursaria chlorella virus 1 (PBCV-1)*

2 *Human papillomavirus (HPV)*

3 *Human immunodeficiency virus 1 (HIV-1)*

4 *Adenovirus*

5 *Potato yellow dwarf virus (PYDV)*

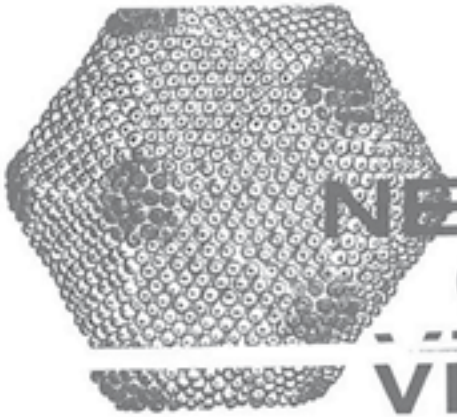
6 *Kaposi's sarcoma-associated herpesvirus (KSHV)*

7 *Influenza virus A*

8 *Tomato spotted wilt virus (TSWV)*

THE NVC TIMELINE

A graphic of the achievements of the Nebraska Center of Virology started as a simple linear timeline and evolved to an abstract graphic highlighting the Center's milestones, research and discovery, and international training and outreach. This graphic, including research featured on scientific journal covers, is wrapped around main column in the lobby.



NEBRASKA CENTER FOR VIROLOGY

2000 Nebraska Center for Virology established as Center for Biomedical Research Excellence with $10.7 million NIH grant

2006 Received $10.6 million NIH COBRE Phase 2

2008 Opening of Ken Monson Life Science Center

2010 Received $5.5 million NIH COBRE Phase 3

2014 Expansion of Ken Morrison Life Science Center

1989 Flyswat, first Nebraska regional virology meeting

2001 First Annual Nebraska Center for Virology symposium

2001 International NIH Fogarty Training Grant established and continuously funded, training more than 52 Zambian scientists at UNL and in Zambia

2002 Research clinic established at University of Zambia Teaching Hospital

2003 Fogarty International Center Training Program in HIV- and AIDS-associated diseases/malignancies expanded into Nankai

China

INTERNATIONAL, TRAINING, & OUT

2004-2021 Received NIH Comparative Virology Research T32 Training Grants

2005 Established Laboratory for Center of Excellence in Pediatric & Family HIV Care at University of Zambia Teaching Hospital

2011-2017 Publications of NIH SEPA outreach: A Planet of Viruses by Carl Zimmer (2011) and the comic books, World of Viruses (2012) and Carnival of Contagion (2017)

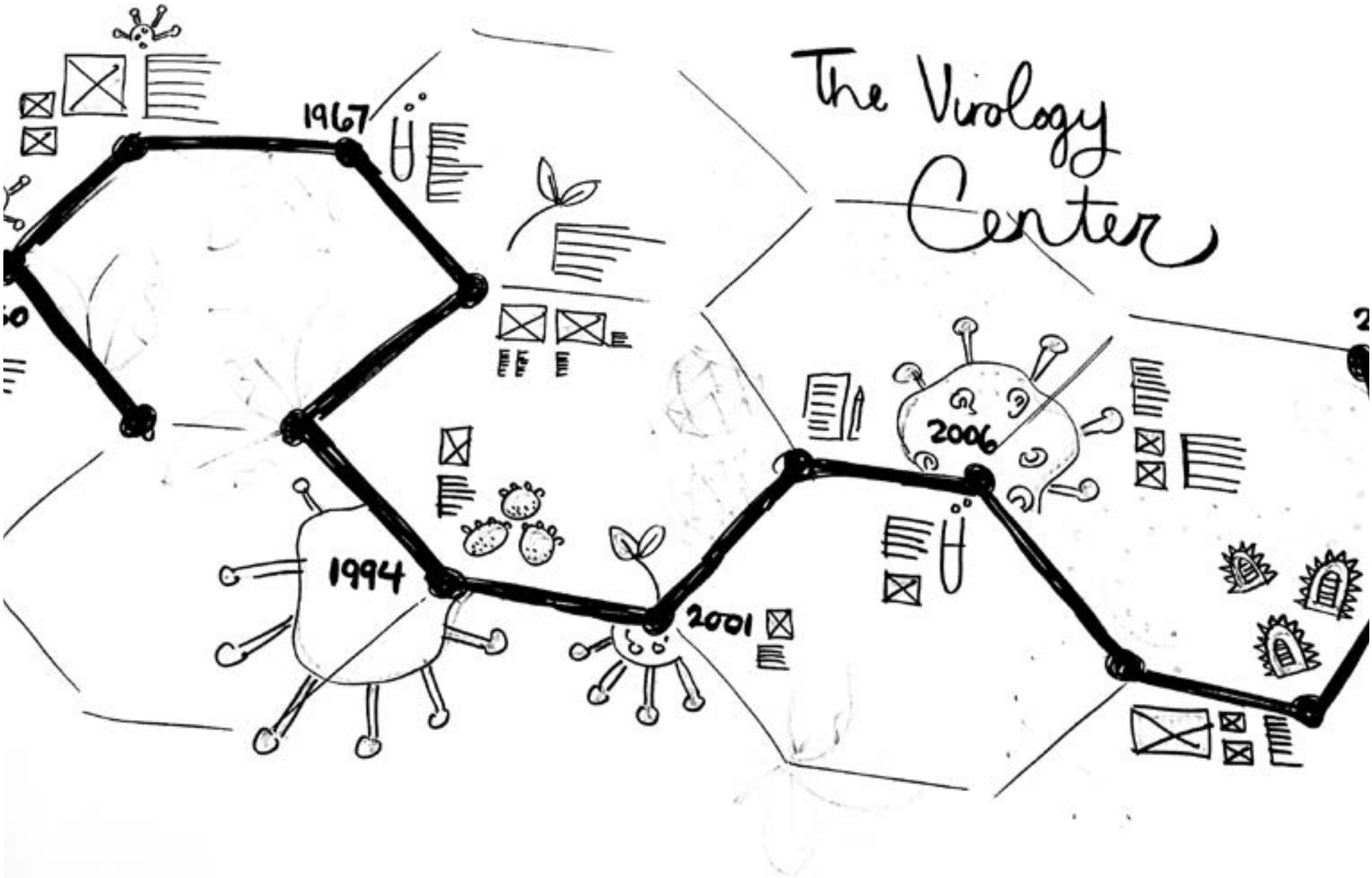
2014 Cancer NIH CRITIC grant to

and build laboratories in Tanzania

2016 AIDS NIH Malignancies Training and Research International Program in Zambia

2004-2015 NIH Comparative Virology Research T32 Training Grant

2016-2021 NIH Comparative Virology Research T32 Training Grant


The Virology Center
1967
1994
2001
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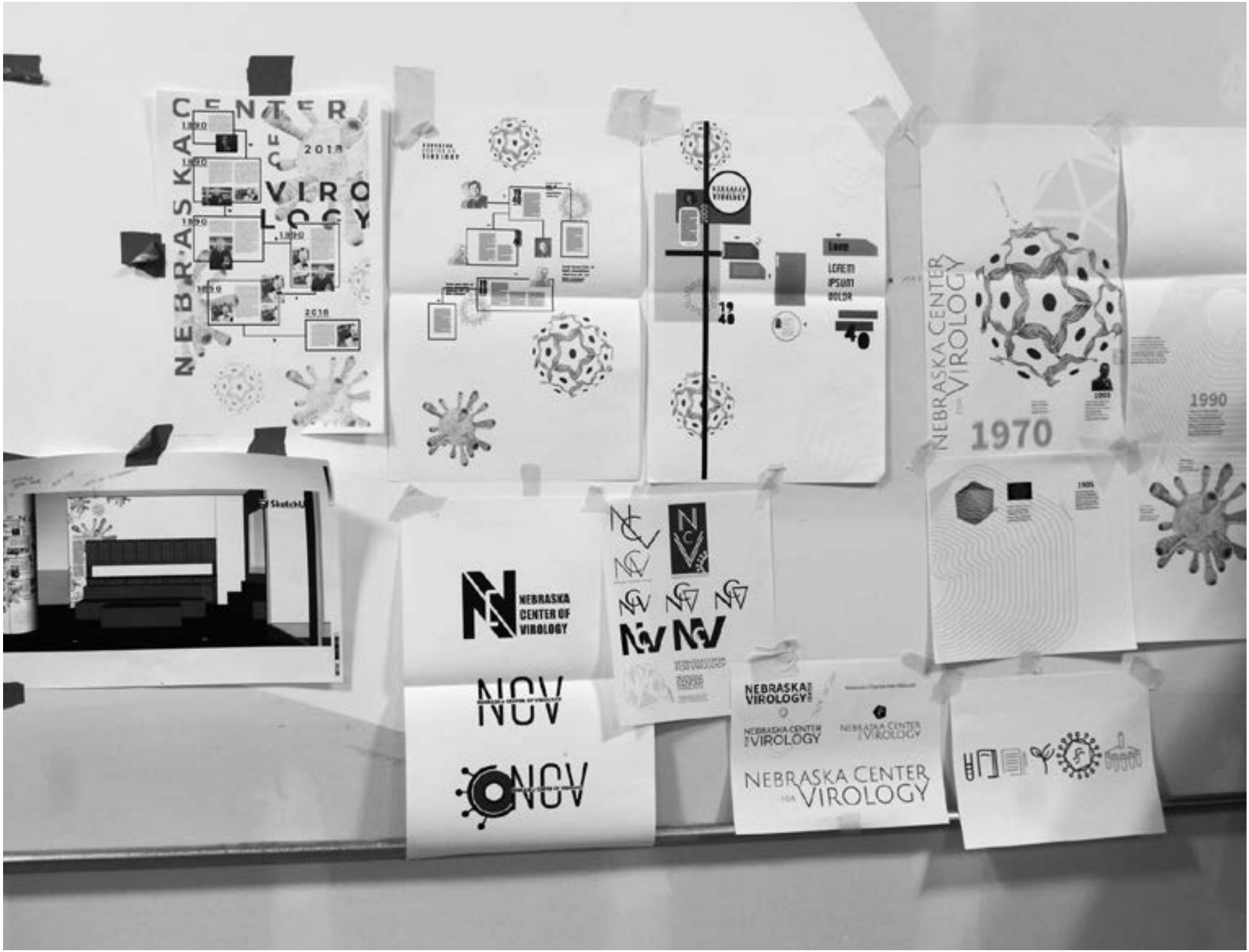
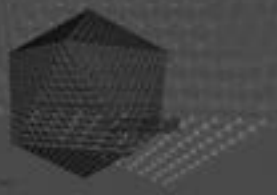

NEBRASKA CENTER FOR VIROLOGY
2018
1970
1990
NEBRASKA CENTER OF VIROLOGY
NCV
NEBRASKA CENTER FOR VIROLOGY

FC VIROLOGY

OUR VISION

It is the vision of the NCV to create a nationally recognized center of biomedical research excellence. The NCV will accomplish this by creating an infrastructure linking the strong virology programs of these three institutions and attracting to Nebraska promising new investigators with similar research interests.



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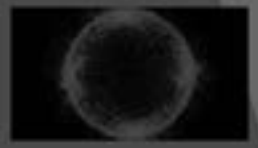

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2008

A full-scale mock-up of the timeline was created to help visualize how the layout looks to scale, determine readability, and how it will look wrapped around a column.

CENTER MILESTONES

1989 Flyswat, first Nebraska regional virology meeting

2000 Nebraska Center for Virology established as Center for Biomedical Research Excellence with $10.7 million NIH grant

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2014 Expansion of Ken Morrison Life Science Center

RESEARCH & DISCOVERY

PRE 1960

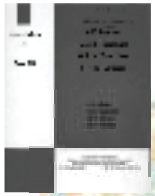
1884 Charles E. Bessey leads first plant pathology publications in Nebraska

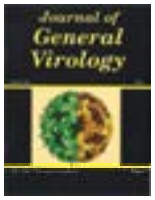
1922 Discovery of wheat steak mosaic virus

1950's ISCO, a Nebraska company, grows out of density gradient technology

1951 Publication of Myron Brakke's first paper on density gradient centrifugation

1956 Technology for derivation and rearing of specific pathogen-free pigs.





1960–80

1960's Discovery of calf diarrhea virus

1963 Development of fluorescent antibody test for Classical Swine Fever Virus, leading to its eradication

1967 Characterization of naked RNA pathogens

1969 Discovery of rotaviruses as agents of diarrhea in mammals

1972 Discovery of coronaviruses as agent of diarrhea in calves

1973 Discovery of the first cystovirus bacteriophage infecting a pathogen of dry bean.

1974 Myron Brakke is first person from Nebraska elected to National Academy of Sciences

1974–75 Patent for combined rota-corona vaccines; gnotobiotic rearing techniques for cattle and swine

1980 Discovery of chloroviruses

1980–2000

1983 Chloroviruses were the first 'plant' virus to be plaque assayed

1985 Discovery that chloroviruses encode DNA restriction endonuclease enzymes

1990–95 Discovery of spontaneous generation of defective interfering RNAs by plant viruses

1993 Discovery of high plains virus

1993 Chloroviruses - first viruses to encode enzymes responsible for glycan synthesis of their glycoproteins

1997 First identification of specific packaging signal in icosahedral plant viral genome

1997 Sequence of a chlorovirus genome was the largest known virus genome at the time

2000 First use of plant virus to express foreign gene in wheat plant

POST 2000

2001 Demonstrated vertical transmission of Kaposi's sarcoma-associated herpes virus from mothers to babies

2001 Discovery that chloroviruses encode smallest protein to form a functional potassium ion channel

2002 Discovery of role of p19 as gene silencing suppressor

2003 James Van Etten elected to the National Academy of Sciences

2005–10 Demonstrations that non-human primates susceptible to infection with chronic wasting disease

2008 Demonstration of viral fitness relationships in mother-to-child transmission of HIV

2012 First demonstration of mechanism of trans-epithelial prion transport

2014 First evidence algae-infecting virus can invade and replicate in mammalian cells

2014 First use of genetic code strategy to develop a vaccine

2015 Porcine reproductive and respiratory syndrome virus vaccine developed

2016 Characterization of long-acting nanoformulated anti-HIV prodrug

2016 First direct evidence of virus generated due to predation

2016 Demonstration that prion strains contain mixture of sub-strains

INTERNATIONAL TRAINING & OUTREACH

2001 International NIH Fogarty Training Grant established and continuously funded, training more than 52 Zambian scientists at UNL and in Zambia

2002 Research clinic established at University of Zambia Teaching Hospital

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2012 Publication of comic book, World of Viruses

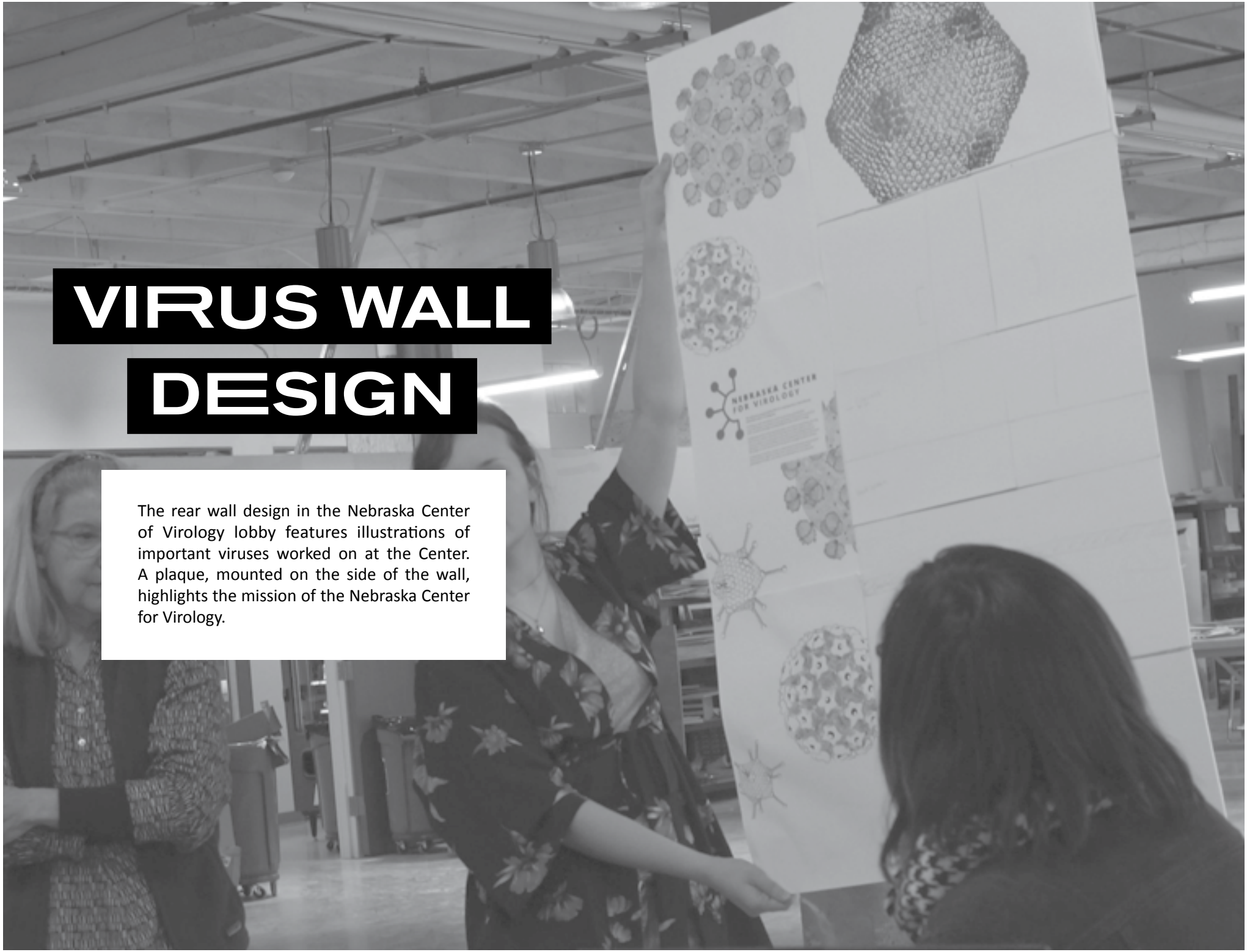
2014 Cancer NIH CRITIC grant to conduct research, train scientists and build laboratories in Tanzania

2016 AIDS NIH Malignancies Training and Research International Program in Zambia

2017 Publication of comic book, Carnival of Contagion

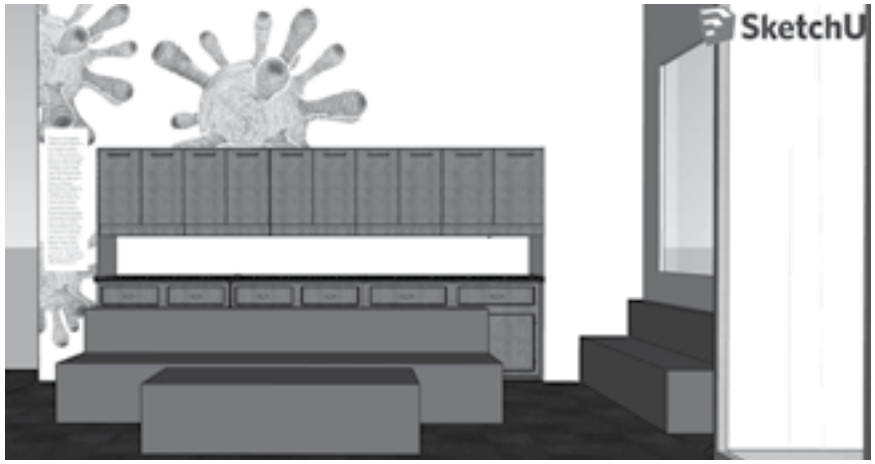
2017 Cancer NIH ZAMDAPP grant to conduct research and train researchers in Zambia

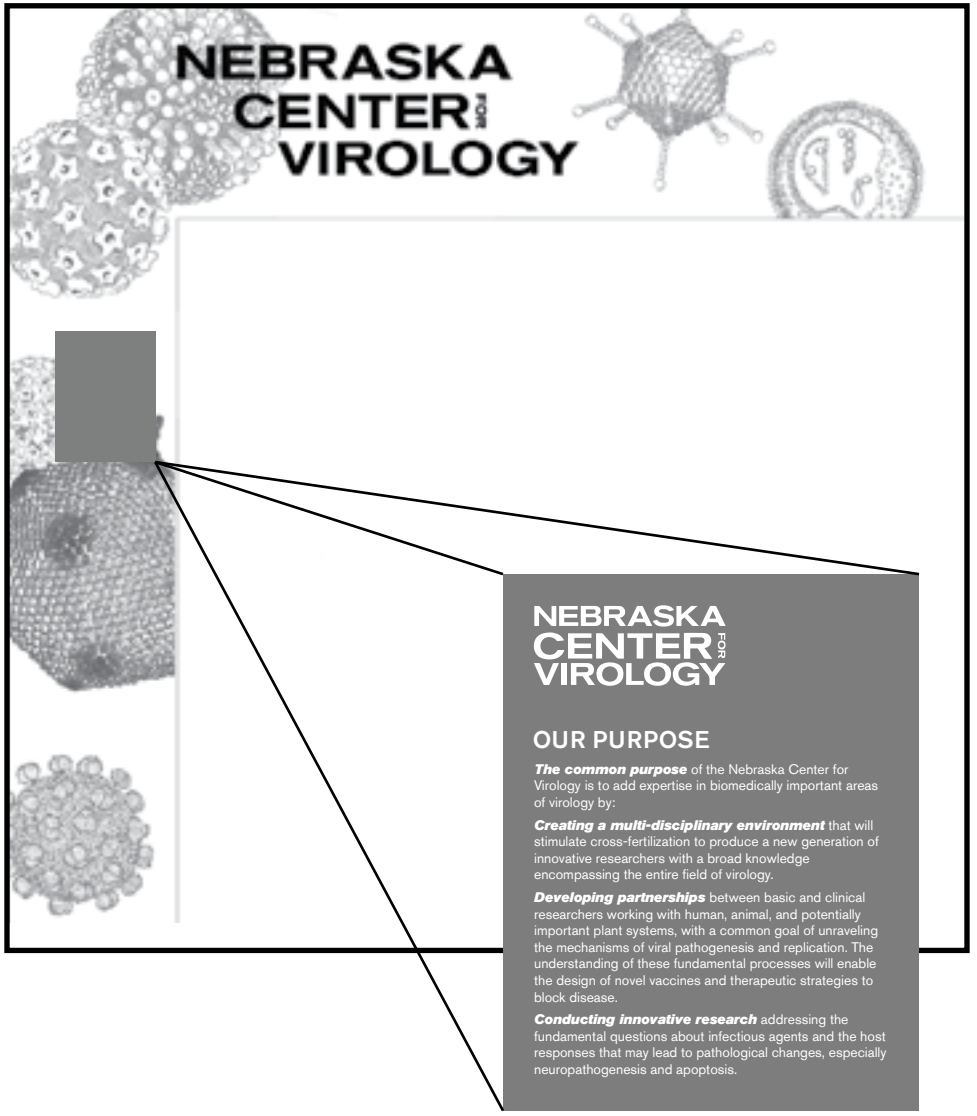
2018 NCV hosts the 9th International Aquatic Virus Workshop



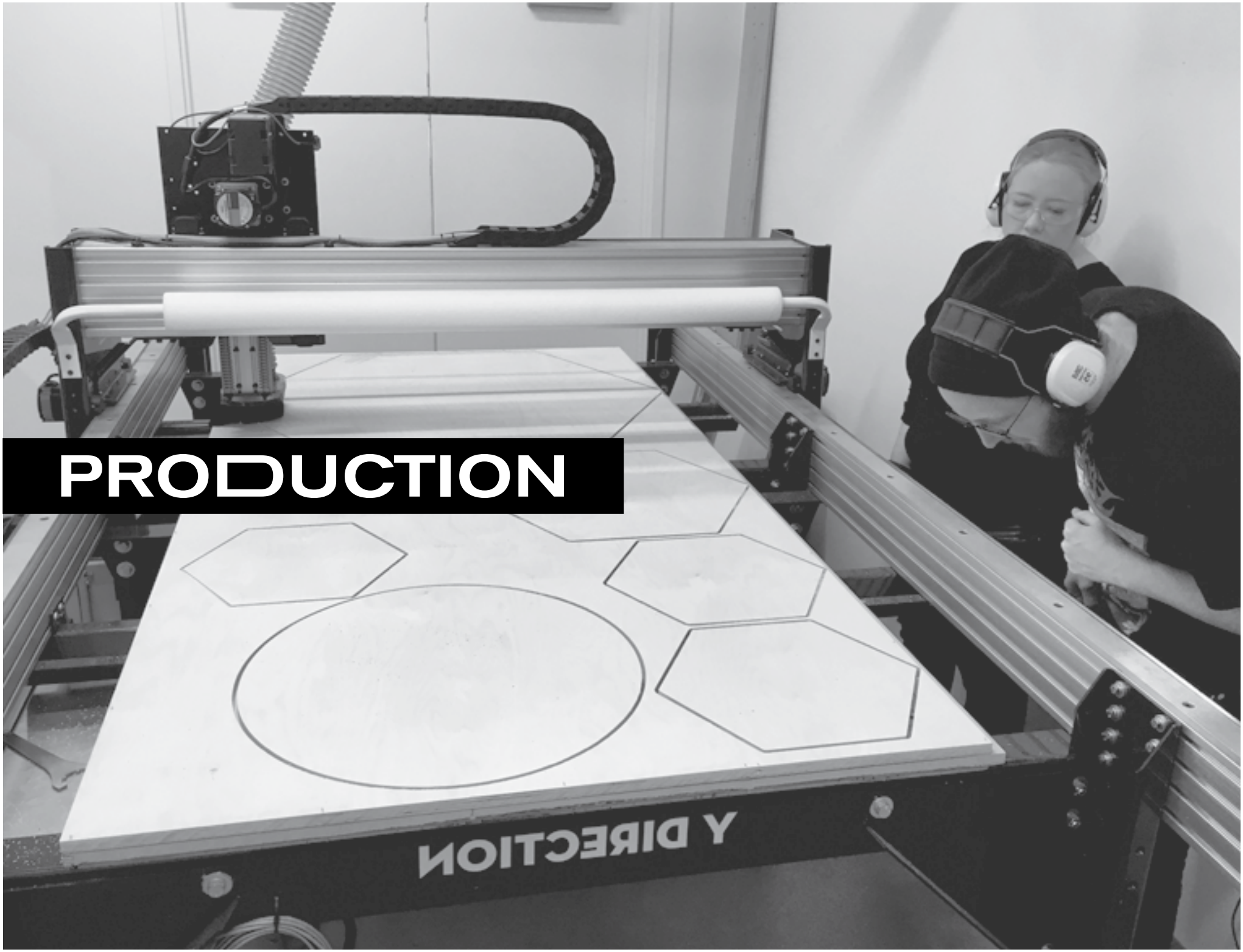
VIRUS WALL DESIGN

The rear wall design in the Nebraska Center of Virology lobby features illustrations of important viruses worked on at the Center. A plaque, mounted on the side of the wall, highlights the mission of the Nebraska Center for Virology.





The virus designs were created on vinyl and the Center title was cut out of black acrylic. The mission statement plaque was mounted to the back wall with an acryclic front.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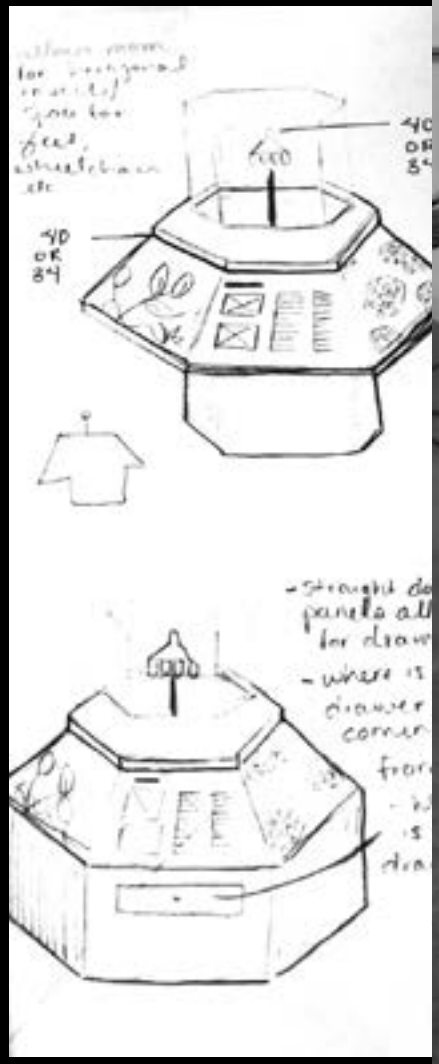
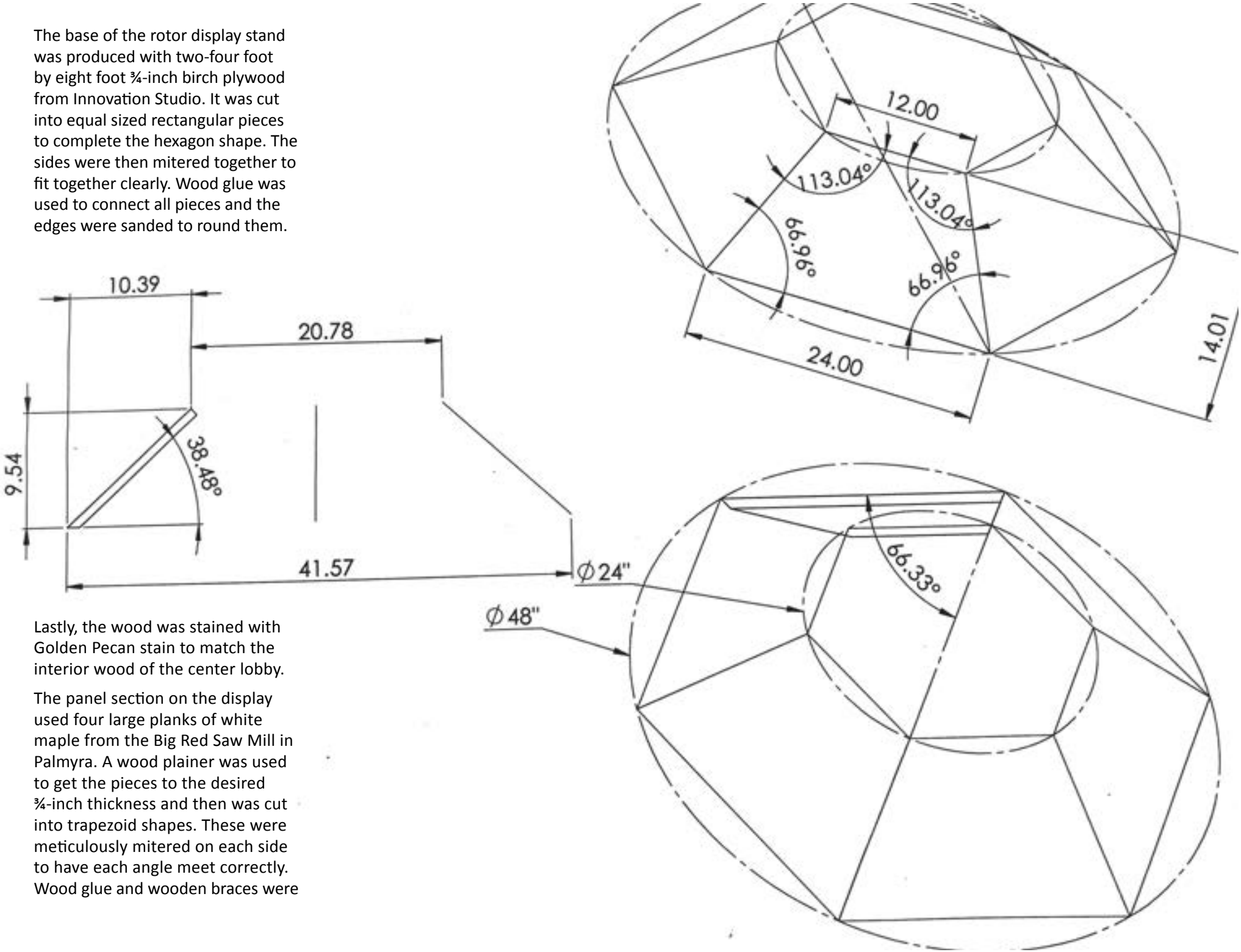


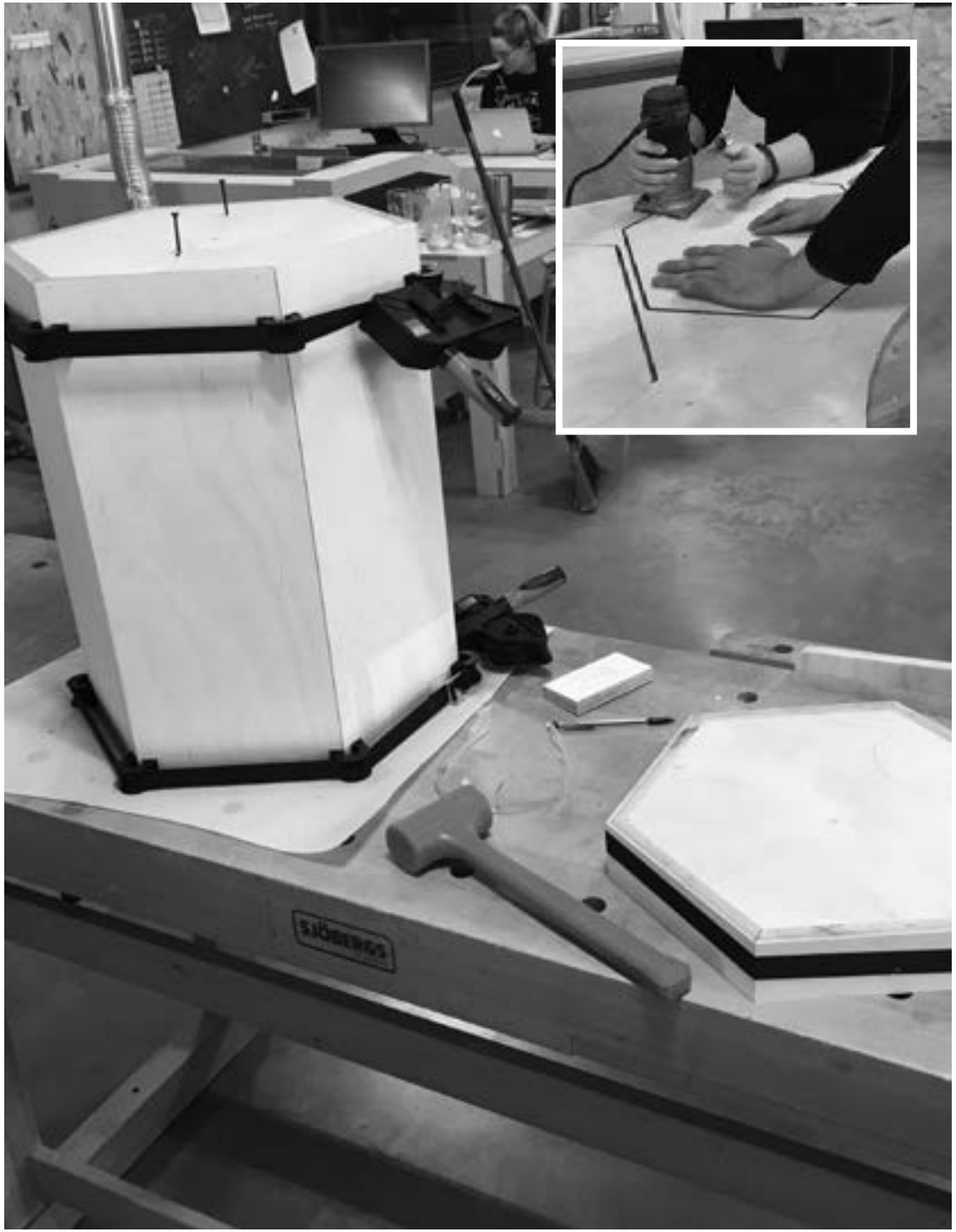
Different materials were researched and tested to understand and decide functionality, quality, and the best fit for the objects and content in our space.

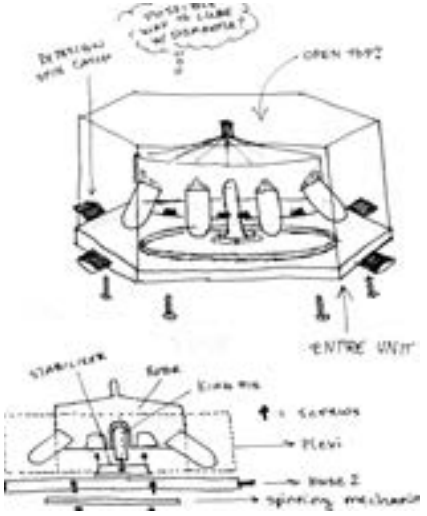
The base of the rotor display stand was produced with two-four foot by eight foot ¾-inch birch plywood from Innovation Studio. It was cut into equal sized rectangular pieces to complete the hexagon shape. The sides were then mitered together to fit together clearly. Wood glue was used to connect all pieces and the edges were sanded to round them.



Lastly, the wood was stained with Golden Pecan stain to match the interior wood of the center lobby.

The panel section on the display used four large planks of white maple from the Big Red Saw Mill in Palmyra. A wood plainer was used to get the pieces to the desired ¾-inch thickness and then was cut into trapezoid shapes. These were meticulously mitered on each side to have each angle meet correctly. Wood glue and wooden braces were





used to connect each trapezoid. Small gaps were filled with wood putty; then the entire piece was sanded, stained with Golden Pecan, and coated with satin finish polyurethane.

A Lazy Susan pedestal was used to allow spinning of the rotor. This section was produced with six small pieces of birch plywood glued together and secured by a nylon belt. The circular piece of the Lazy Susan was produced with ¾-inch sheet of birch plywood, cut with the C&C router. This was also sanded, stained, and coated with satin finish polyurethane. The Lazy Susan itself was attached to the circle and base with screws. The case for the rotor display is an enclosed acrylic cylinder.

APPENDICES

Sponsors

Andrew O. Jackson, Professor Emeritus, Plant & Microbial Biology, University of California, Berkeley.

Thomas Jack Morris, Distinguished Professor, School of Biological Sciences, University of Nebraska-Lincoln.

Susan Weller, Director of the University of Nebraska State Museum and Professor, Entomology, University of Nebraska-Lincoln.

Biology of Human NIH SEPA Project (Principal Investigators: Judy Diamond, Charles Wood, and Julia McQuilllan).

Advisors

Aaron Sutherlen, Assistant Professor of Art, School of Art and Art History, University of Nebraska-Lincoln.

Judy Diamond, Professor & Curator of Informal Science Education, University of Nebraska State Museum.

Katie Kcrmarik, Assistant Professor of Practice, College of Journalism and Mass Communications, University of Nebraska-Lincoln.

David Martin, Director of the Nebraska Innovation Studio.

Jerry Reif, Shop Manager of Nebraska Innovation Studio.

Robb Nelson, Graduate Teaching Assistant, Department of History, University of Nebraska-Lincoln.

Students

Mahra Al Raisi, Bachelors of Fine Arts, Graphic Design, School of Art, Art History & Design.

Jinell Carslin, Bachelors of Fine Arts, Graphic Design, School of Art, Art History & Design.

Tiah Davis-Northway, Bachelors of Fine Arts, Graphic Design, School of Art, Art History & Design.

Ruth Grady, Master of Arts in Anthropology College of Arts and Sciences.

Devra Hock, Master of Science in Earth and Atmospheric Sciences (candidate); College of Arts and Sciences.

Jacob Kennedy, Bachelors of Arts, Graphic Design, Minor in Architecture studies, School of Art, Art History & Design.

Daisha Marquardt, Bachelors of Fine Arts, Graphic Design, School of Art, Art History & Design.

Madison Mascare, Bachelors of Fine Arts, Graphic Design, School of Art, Art History & Design.

Steven Petty, Bachelors of Arts, Anthropology, College of Arts and Sciences.

Daisy Sarne, Bachelors of Journalism and Bachelors of Arts, College of Journalism and Mass Communications and College of Liberal Arts.

Cameron Scheele, Bachelors of Fine Arts, Graphic Design, School of Art, Art History & Design.

Phuc Tran, Bachelors of Fine Arts, Graphic Design, School of Art, Art History & Design.

Carlos Juan Velasco, Bachelors of Fine Arts, Graphic Design, School of Art, Art History & Design.

Amanda Wade, Bachelors of Fine Arts, Graphic Design, School of Art, Art History & Design.

Monica Zurek, Bachelors of Advertising and Public Relations, Minor in Business, College of Journalism and Mass Communications.

Learn more at

MyronBrakkeExhibit.unl.edu