

Designing a Mobile Modular Closet

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PROJECT MISSION

Produce a sustainable design of a multi-purpose closet that maximizes movement, portability, functionality, and that matches the target price-point with the purchase of our 'Spartan' product.

PROJECT GOALS

Design of Modular, Mobile Closet:

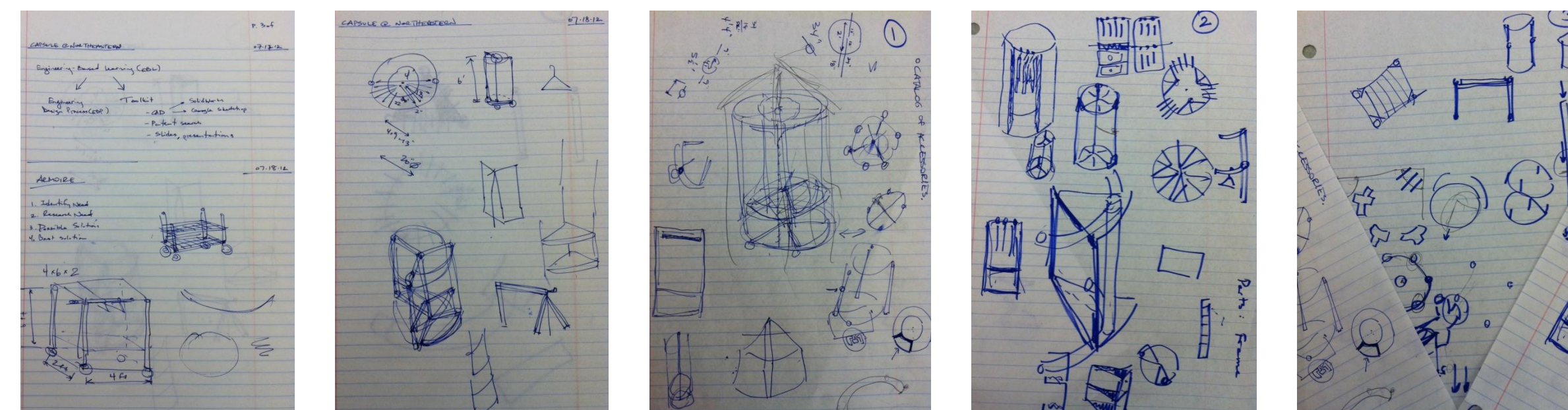
- 1)360° Rotation about central axis
- 2)Mobile: on wheels
- 3)Modular: creation of accessory library for BYO
- 4)Designed with safety and stability in mind
- 5)Aesthetic components

PROJECT PLAN

- 1.Spend time developing solutions to this challenge.
- 2.Produce the parts and assembly using SolidWorks.
- 3.Conduct Environmental Impact Study (Using SolidWorks Sustainability Function) with Assembly trying several types of materials. Decide on best.
- 4.Run Stress Analysis (FEA) on hanging rod.
- 5.Communicate our solution.

POSSIBLE SOLUTIONS

George's free-hand concept illustrations:



Initial design based on square concept

Circular design introduced

Center of Mass and Force Stress analysis

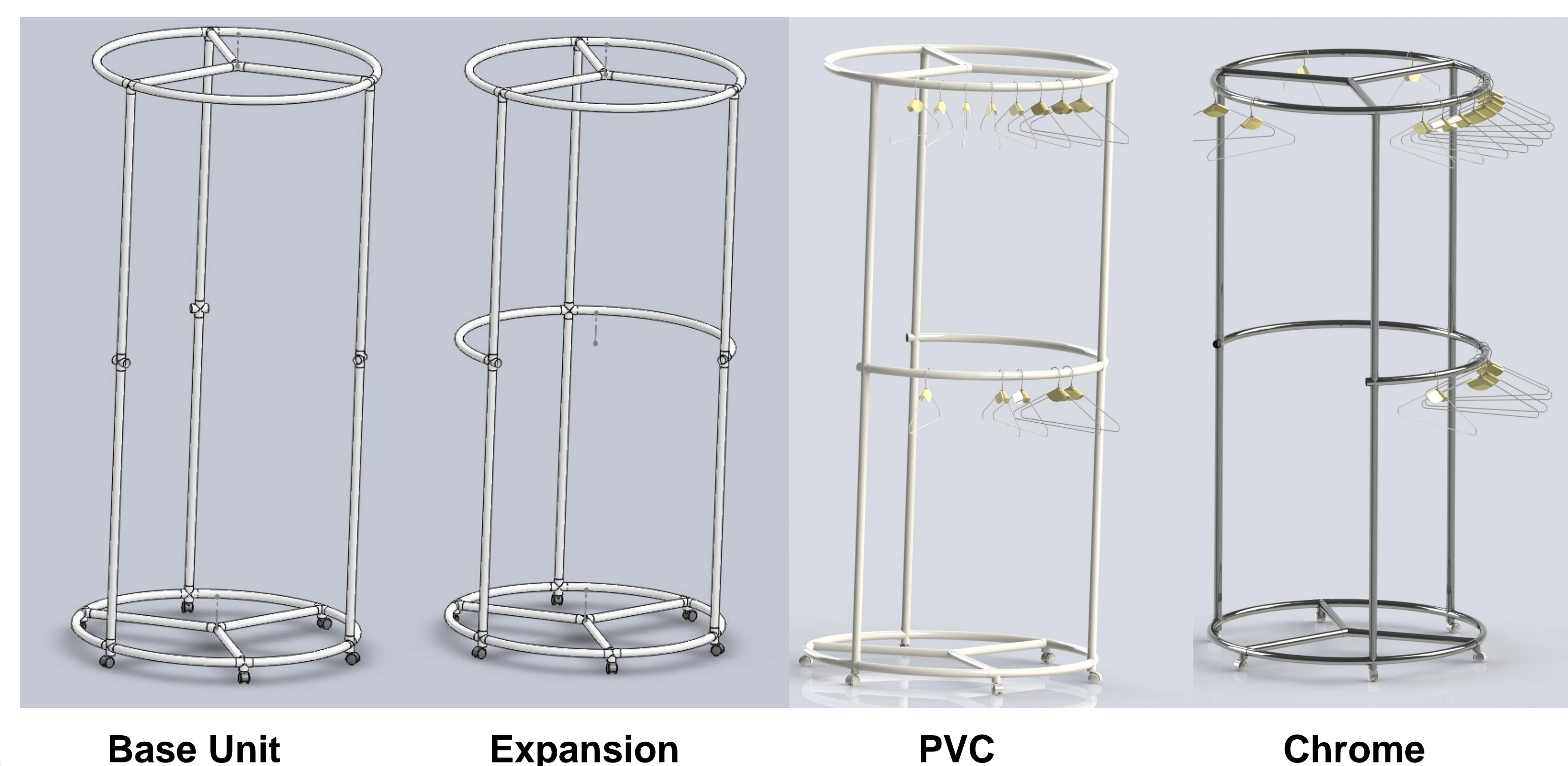
Maximizing Space and Modular Concepts

Maximizing Modular Components

Background Research Images of Modular Hanging and Standing Units:



FINAL SOLUTION: SPARTAN



Base Unit

Expansion

PVC

Chrome

LESSONS LEARNED

The time frame was only long enough to produce only a conceptual product. This allowed us to be in our students' shoes for a change, we had a chance to feel the stress we as teachers can put on our students when we give out projects and short timelines.

We needed to work together to develop our ideas but in the end we needed to split off and focus on individual tasks. We worked in different aspects of the projects but we were in constant contact bouncing ideas and giving help when needed. This allowed us to see the future of the design process where people can work together in a cloud (thus they can be anywhere in the world). This allows a project manager to pull from specialists in desired fields.

We found that it was easier to create a new piece in solid works rather than trying to find it on the internet. The feature manager design tree with in solid works is extremely helpful.

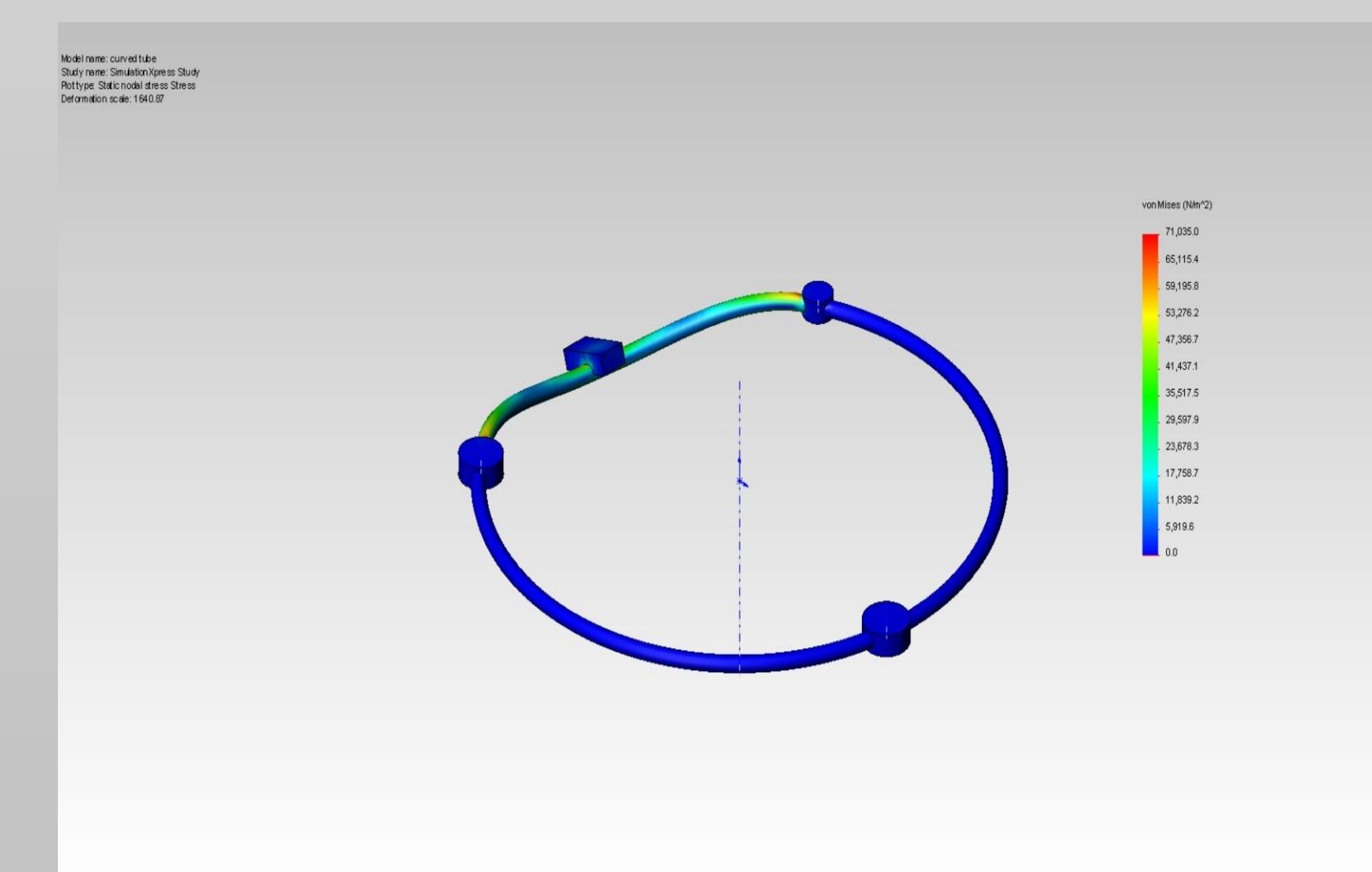
Spending more time on brainstorming was helpful, it allowed us to be creative and combine ideas. The more time we spent on brain storming the better our final product became.

Keep or design as simple as possible so that our CAD personnel had time to finish a basic design within the time constraints.

We had an eclectic group: Three males and one female. Our teaching backgrounds were also diverse: One Biologist, one Robotics, one Chemist and last but not least Physics. This eclectic group allowed us to pull from our individual backgrounds, strengths and life experiences to create our unique solution to our design problem.

Technical Knowledge gained: Use of SolidWorks, i.e. Circular component pattern – Useful when doing the assemblies because it speeds up drawing symmetrically repetitive patterns. Also, the Sustainability and FEA tools are very interesting and useful in a lot of subject areas.

FEA EVALUATION



Minimal Displacement of 0.05mm with 200N load.