



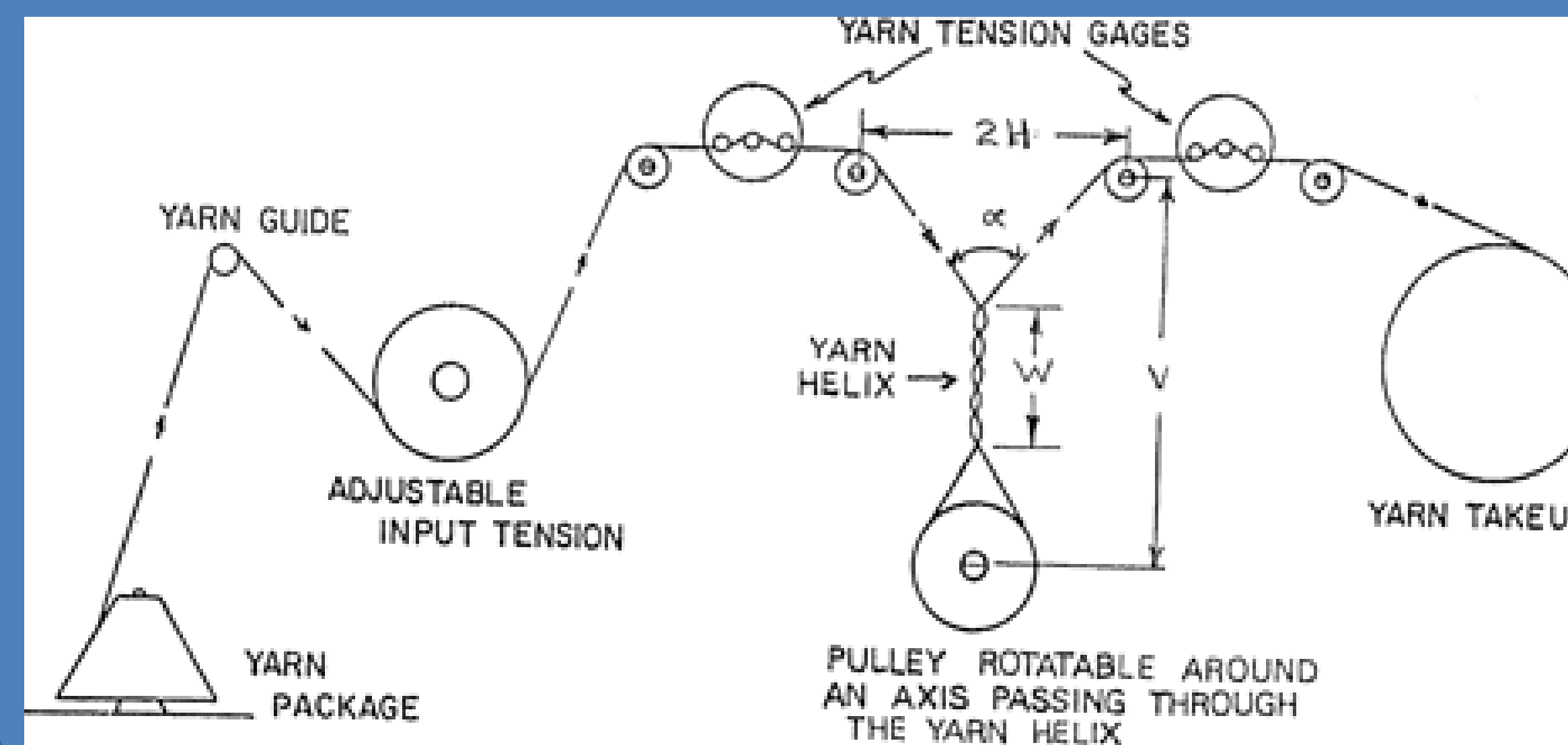
In-Situ Friction Analysis Between Reinforced Fibers



Problem Statement

- Design and build a mechanism capable of measuring friction forces between polymeric fibers
- Update current model of testing (ASTM Test Method D3412) for use in scanning electron microscope

Proposed Design



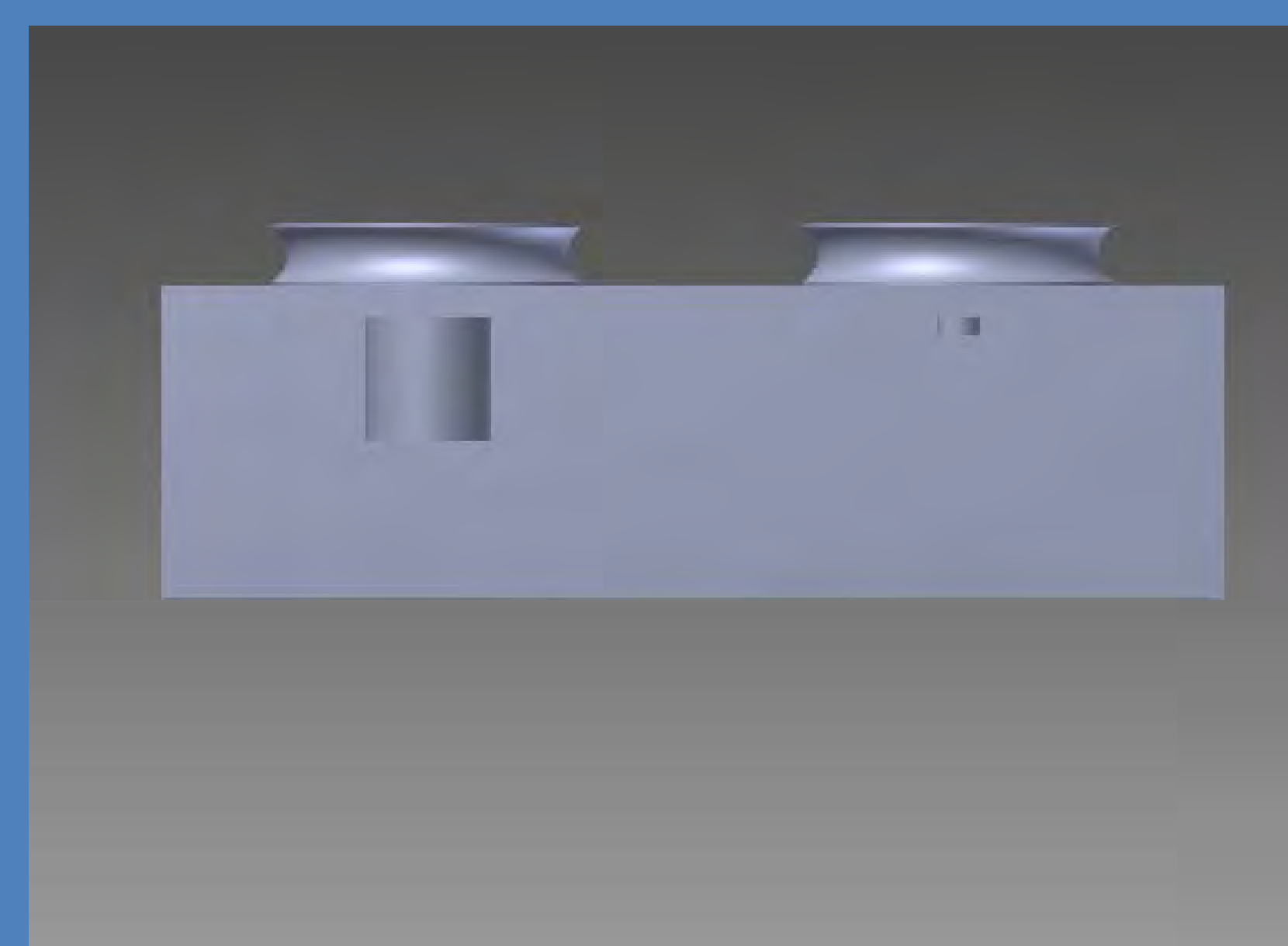
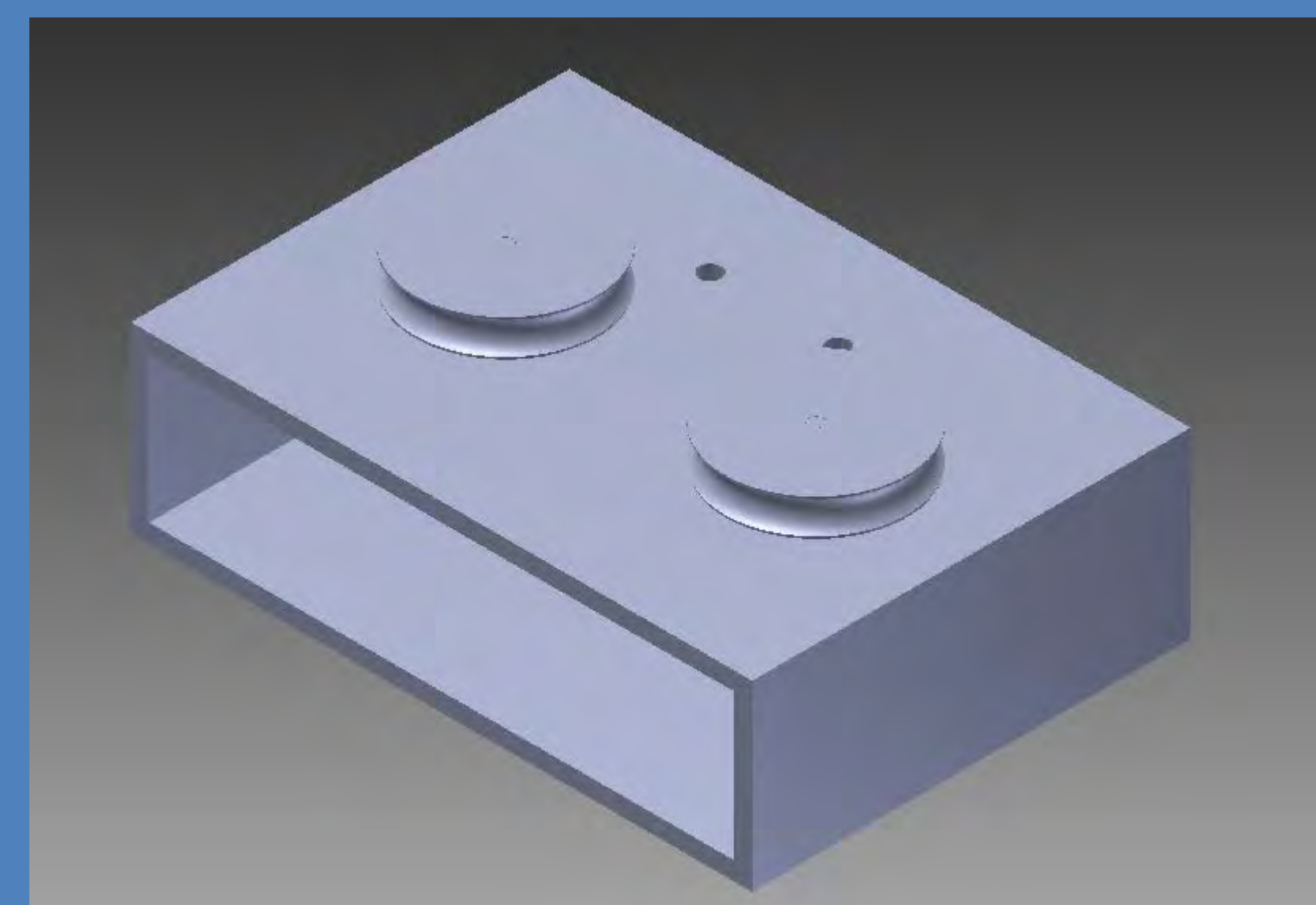
Design Objectives

- Must fit in space of dimensions 170mm x 120mm x 50mm
- Motor should pick up between 1 and 4 inches of yarn per minute
- Requires input tension device
- Must be vacuum-friendly and SEM compatible

Motivation

- Understanding friction analysis on the nano scale
- Evaluating and enhancing materials
- Modernizing and reforming the testing standard

Model



Prototyping and Testing

- Solidworks modeling and motion analysis of prototype
- Construction and testing of prototype under working conditions
- SEM integration

Timeline

#	Name	September 2012				October 2012				November 2012				December 2012			
		M3	M10	M17	M24	M1	M8	M15	M22	M29	M5	M12	M19	M26	M3	M10	
0	Mission List																
1	Literature Research																
2	Material Selection																
3	Synopsis																
4	Soft Copy Poster																
5	Presentation																
6	Report Paper 10%																
7	Solidworks Modeling																
8	Report Paper 25%																
9	Optimization																
10	Poster Due																
11	Engineering Analysis																
12	Evaluation																
13	Cost Budget Calculat																
14	Elements Selection																
15	IAB Presentation																
16	Application																

Team Members



Eduardo Escobar



Jean Paul Arroyo

Advisor: Dr. Benjamin Boesl