
Project 57: Aluminum for H₂ Service

***Semi-annual Fall Meeting
October 2021***

- Student: Adam Freund (Mines)
- Faculty: Suveen Mathaudhu, Amy Clarke, Kester Clarke (Mines)
- Industrial Mentors: John Carsley, Atish Ray (Novelis)

Project 57: Aluminum for H₂ Service



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- Advisor(s): Suveen Mathaudhu (Mines)

Project Duration
PhD: September 2021 to Dec 2025

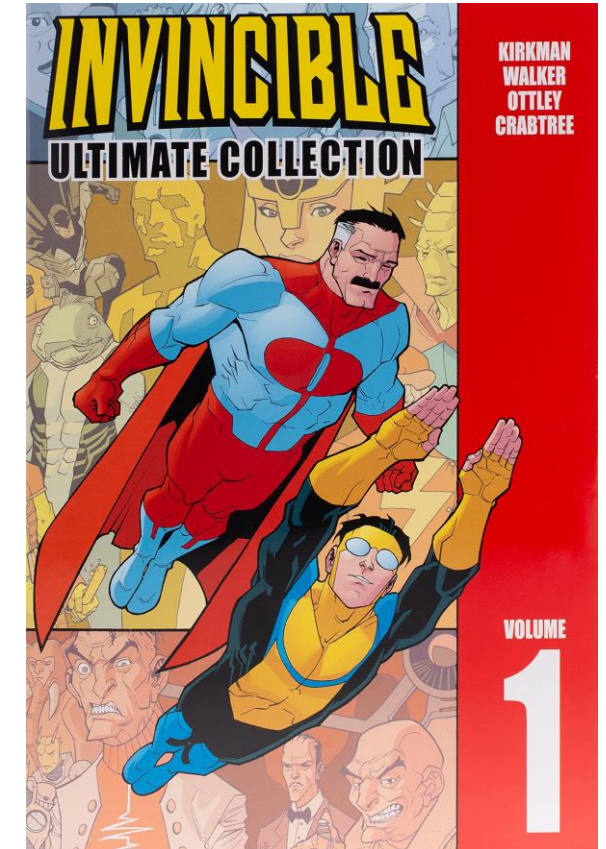
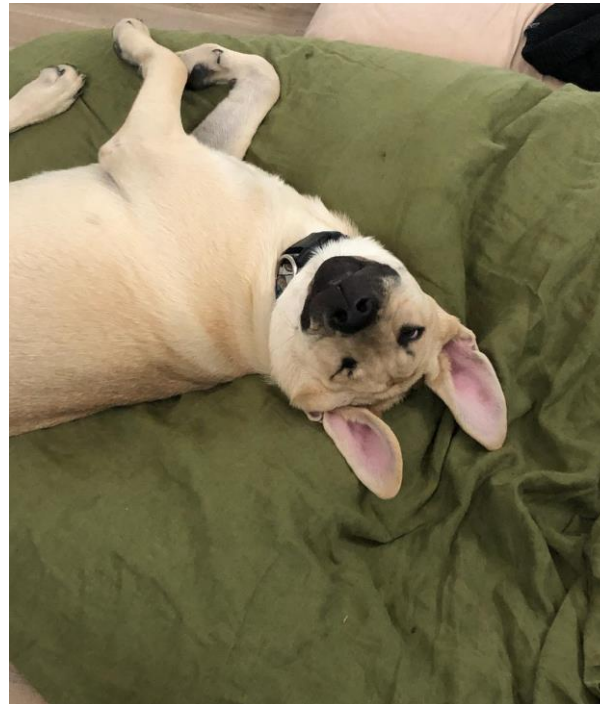
- **Problem:** Hydrogen embrittlement of wrought aluminum alloys is poorly understood and requires further examination for use in structural and energy applications.
- **Objective:** Develop an in-depth understanding of how hydrogen embrittles wrought aluminum alloys and its effects on mechanical properties and microstructure.
- **Benefit:** Enhanced understanding of hydrogen embrittlement mechanisms will result in less failures and extended part lifetime.

- Recent Progress**
- Initiated literature review to gain an understanding of the state-of-the-field
 - Coursework in progress
 - Equipment training in progress
 - Designing experimental procedures and characterization methods

Metrics		
Description	% Complete	Status
1. Literature review	15%	●
2. Hydrogen charging procedure development	5%	●
3. Fatigue testing of charged samples to examine embrittlement effects	0%	●
4. Quasi-static testing of charged samples	0%	●
5. Microstructural characterization	0%	●

About Me

- Master's Degree, Physical Chemistry (2020)
 - Freund, A., Gonzalez, D., Buelna, X., Ancilotto, F., & Eloranta, J. (2018). Density functional theory modeling of vortex shedding in superfluid He4. Physical Review B, 98(9). doi:10.1103/physrevb.98.094520



Thank you!
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