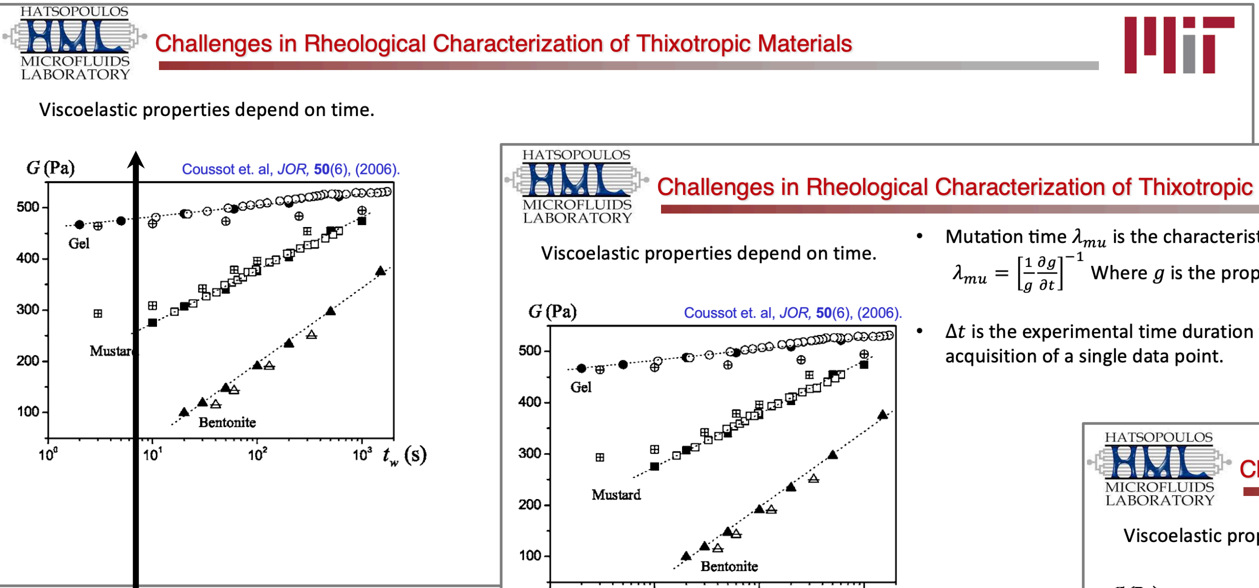
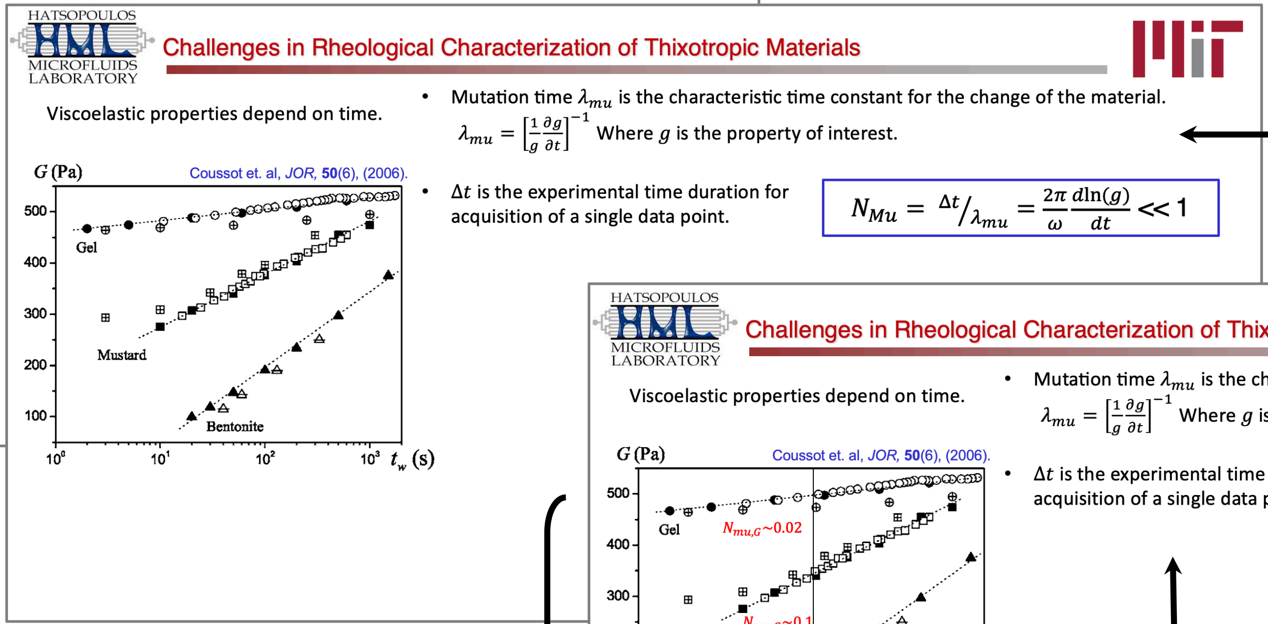
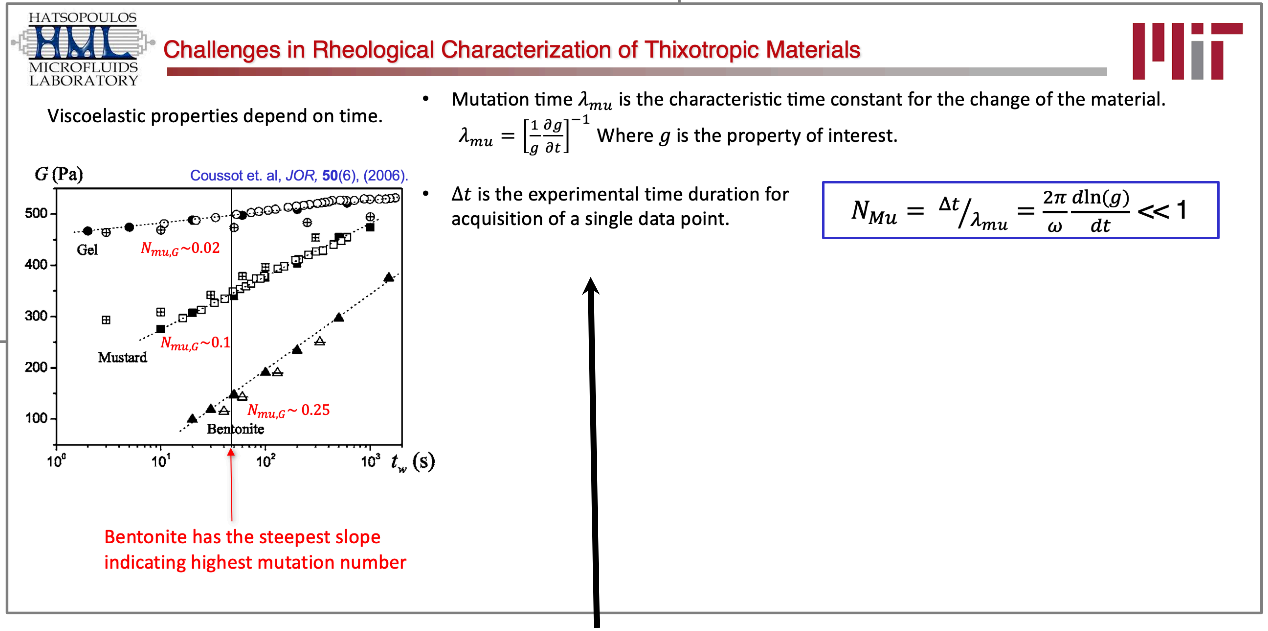
Make sense of background info for your audience…

…don't just list facts





Information is introduced sequentially and builds on previous statements



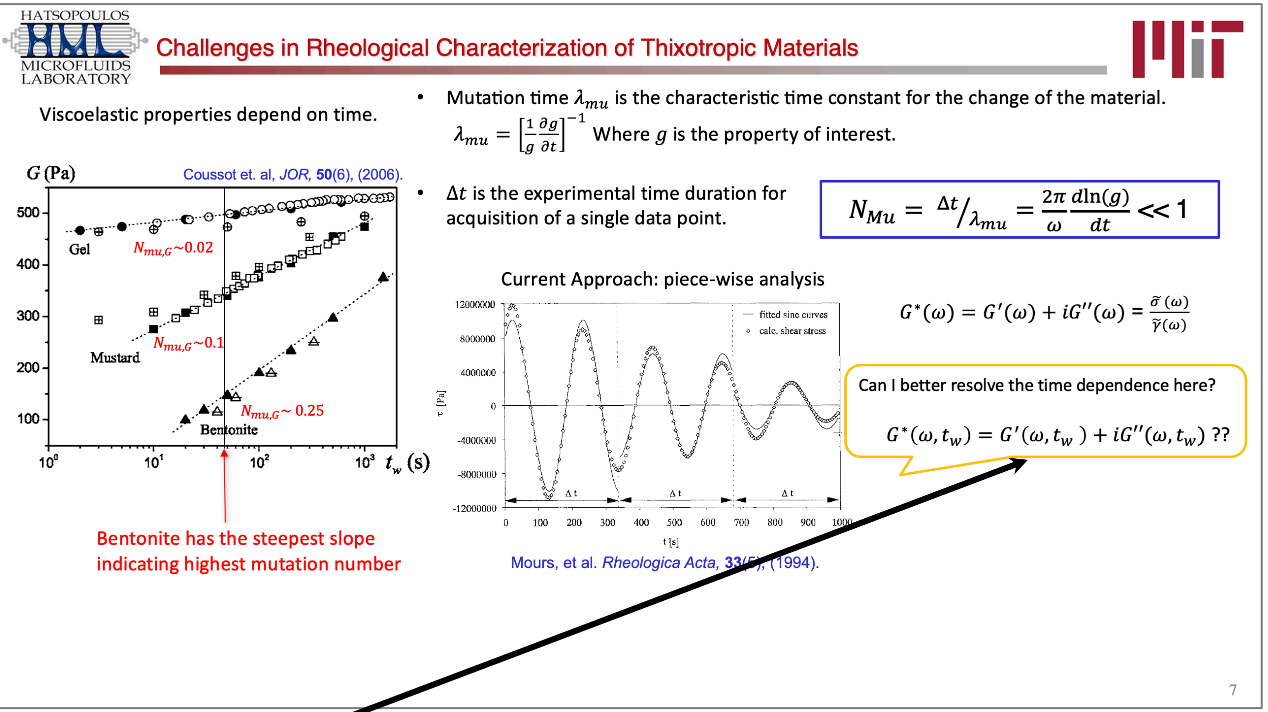
Presents one general claim/ statement before backing up with more nuanced statements/claims

Uses color to highlight the reasoning behind a key claim

Provides complete picture of existing literature without giving excess detail

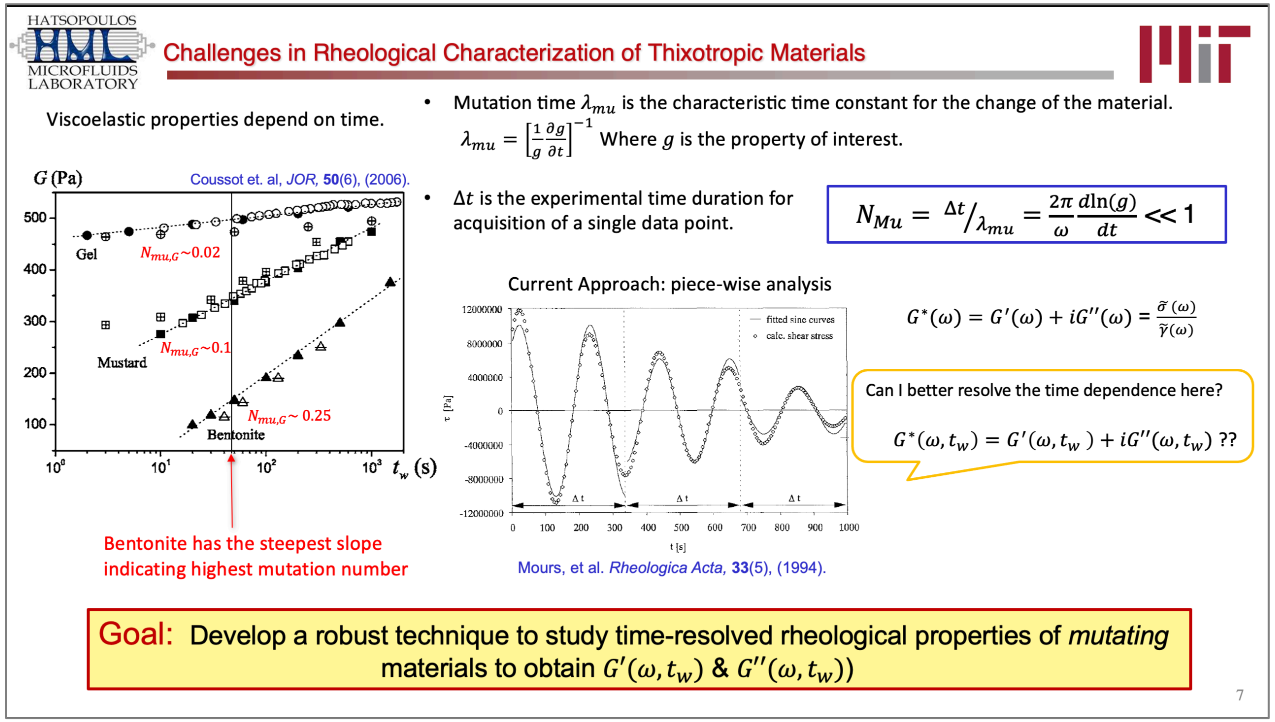
Use equations to show your thinking…

…not just to show that you did math



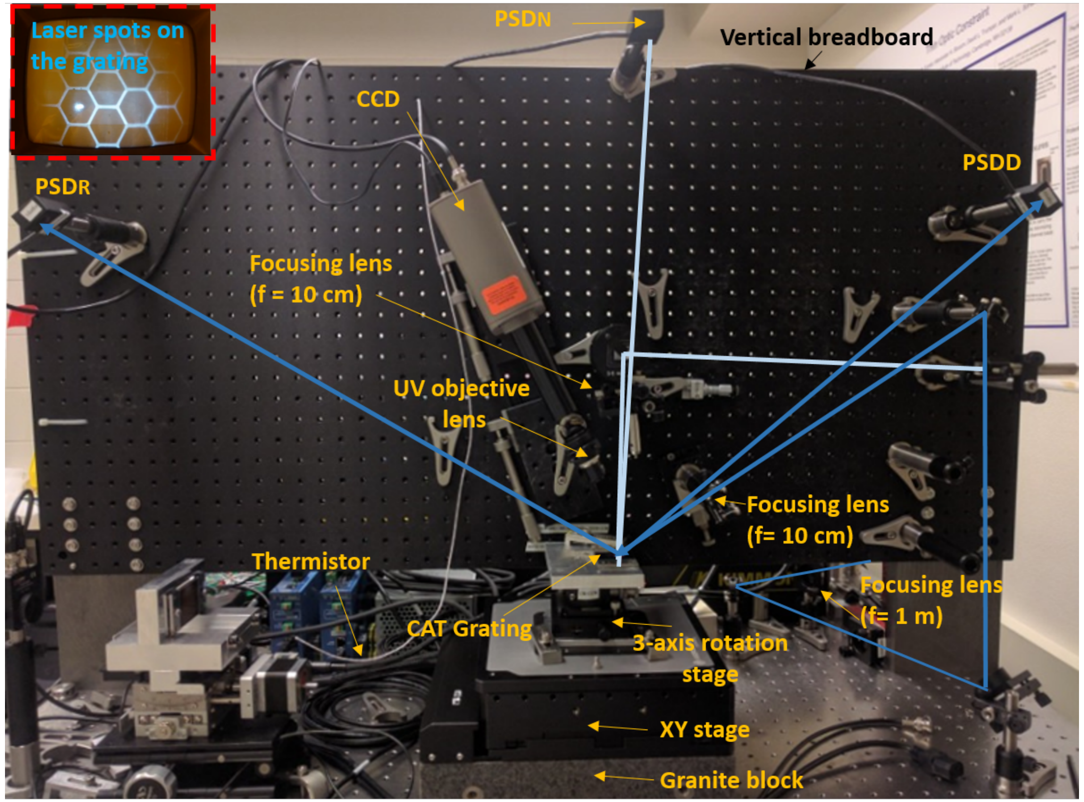
Research thought process is articulated

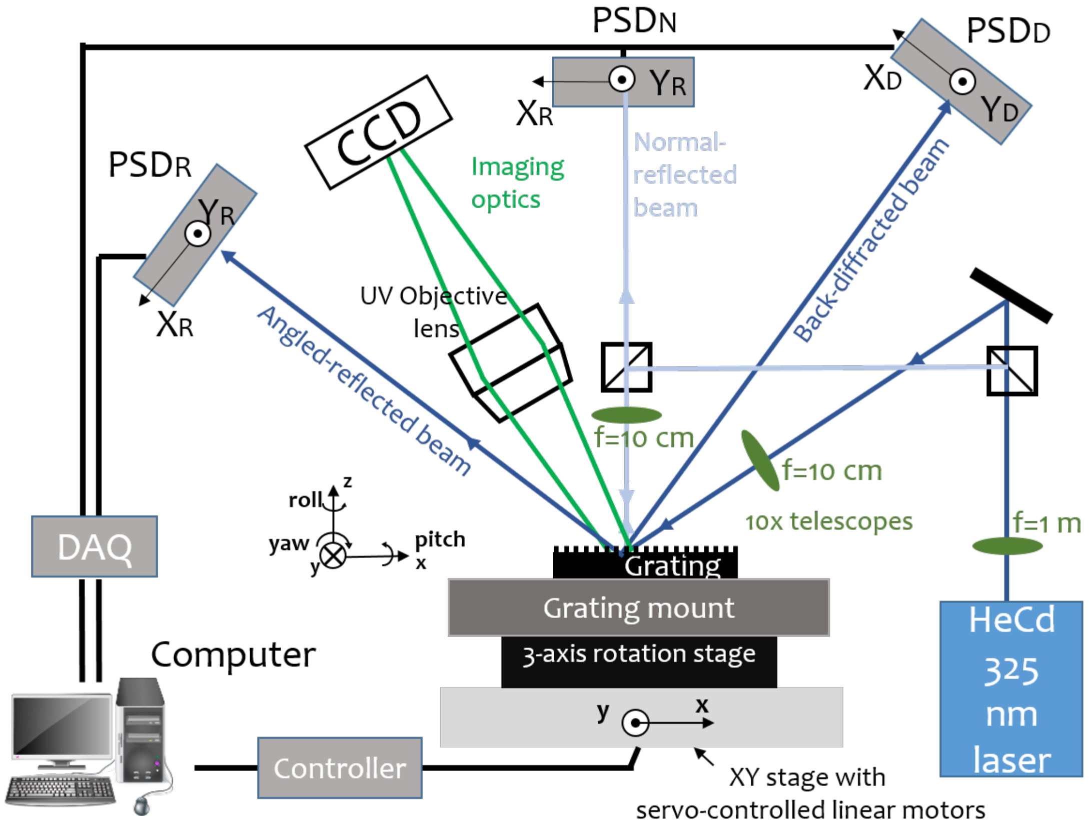
Main message is visually distinct, even though the slide is (very) complex



Consider using schematics of experimental setups

Which do you find easier to follow?





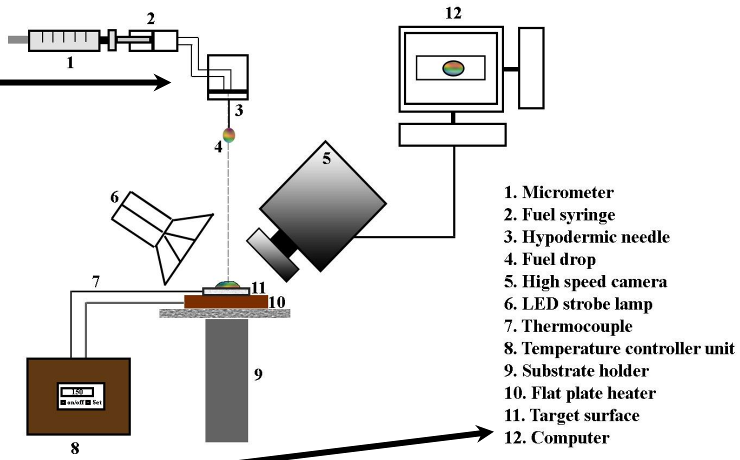
Courtesy of Jungki Song

Consider using schematics of experimental setups

Keeps components and links at 90° when possible (helps reduce clutter)

Only include relevant components

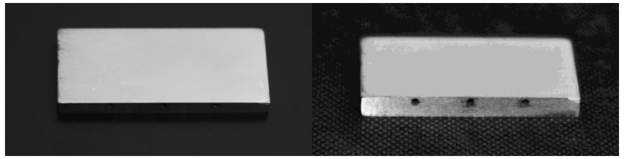
Experimental setup and parameters



Fuels	Density (kg/m^3)	Viscosity (Pa s)	Surface Tension (N/m)	Boiling Point (^{0}C)
Heptane	681.7	0.388×10^{-3}	0.0197	98.4
Decane	728.0	0.853×10^{-3}	0.0234	174
Jet A-1	786.7	1.180×10^{-3}	0.0256	207.6*
Diesel	818.0	3.460×10^{-3}	0.0267	271.1*

* Volumetric Average Boiling Point

Four fuels chosen with varying viscosity and boiling points



Solid surface for impact: Smooth stainless steel placed on plate heater

Fuel drop spreading process is studied using high speed visualization

Qualitative observations: through images
Quantitative study: through image processing

Varying parameters
Impact Height H ~ 30-750mm
Surface Temperature T_s ~ 30 ^{0}C to 410 ^{0}C
Fuel type

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Emphasize the physics and meaning in equations

- Only use equations as they directly support your message
- Define all terms, and **highlight significant ones**
- Be familiar with the derivation, and underlying assumptions

$$\phi_{nb} \propto h_{fg} f N' D_d^3$$

Nucleate boiling heat flux

Latent heat of evaporation

Bubble departure frequency

Nucleation site density

Bubble departure diameter

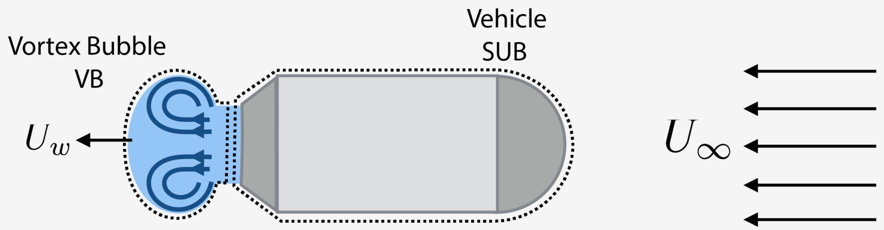
Audience will know to look out for this key term

Audience might not be familiar with all terms

Equations Example 1:

How do F_T and η for a vehicle relate to the generated vortex?

from Ruiz et al. 2010 JFM



η	Hydrodynamic Efficiency
F_T	Thrust generated by vehicle
α_{xx}^{VB}	Vortex Ring Added Mass Coefficient
U_w	Vortex Ring Velocity
$\forall_w$	Vortex Ring Volume
U_∞	(Steady) Vehicle Velocity
$\dot{W}$	Power Transferred to Free Stream

Terms are clearly defined

$$F_T \approx \frac{\partial}{\partial t}((1+\alpha_{xx}^{VB})U_w \forall_w) \quad [1]$$

$$\eta = \frac{\langle F_T U_\infty \rangle}{\langle \dot{W} \rangle} \approx \frac{2}{3}(1+\alpha_{xx}^{VB})\frac{U_\infty}{U_w} \quad [1]$$

Equations correspond to slide's message

*Assumes:
- steady vehicle velocity
- Re >> 1

Assumptions are stated

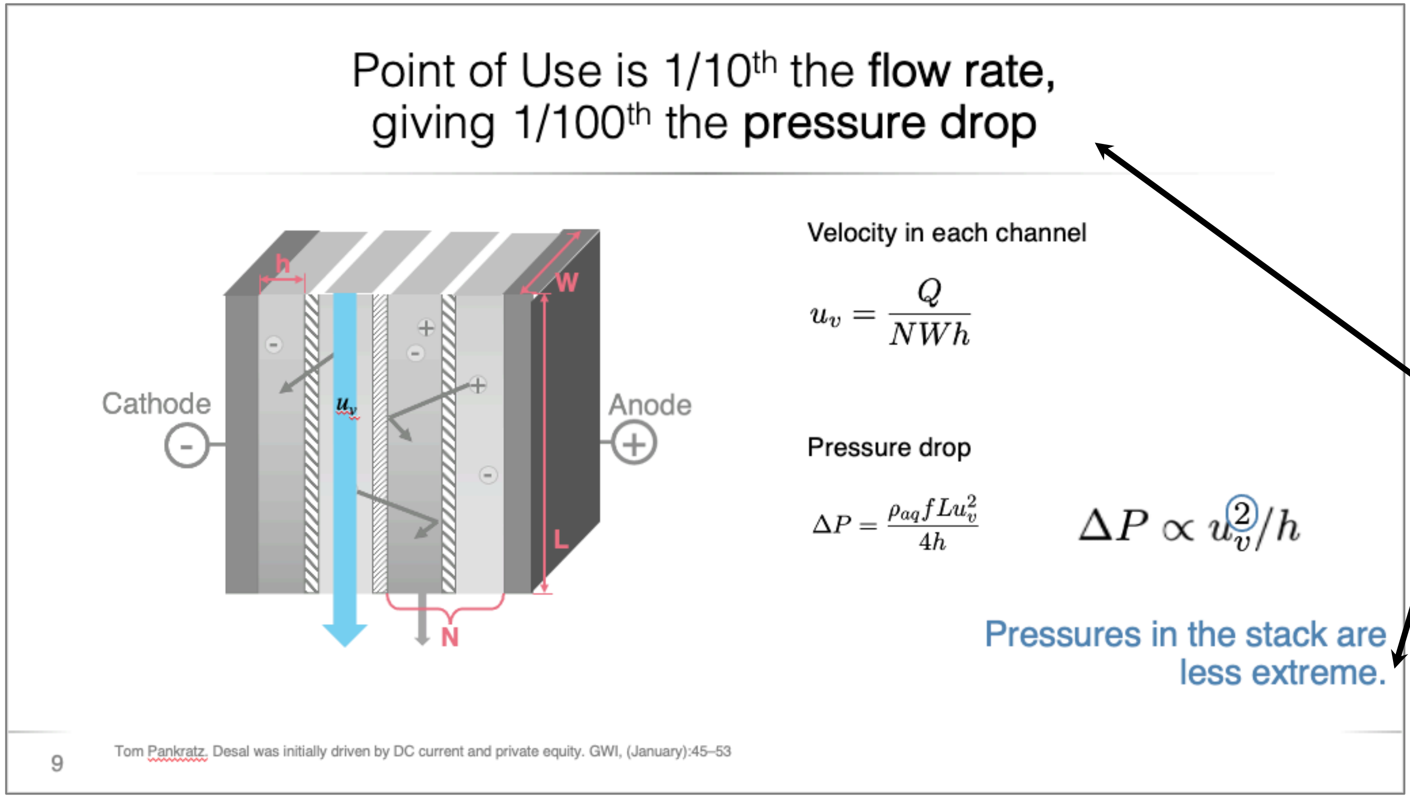
Leverage these relationships to estimate thrust and efficiency visually by measuring vortex speed and geometry

Key terms are highlighted and correspond to underlines

(1) L. A. Ruiz, R. W. Whittlesey, J. O. Dabiri, Vortex-enhanced propulsion. Journal of Fluid Mechanics 668 , 5 (2010).

Equations Example 2:

Use color to highlight components



Significance of the relationship is explicit

Use space or color to make connections

Clear separation of data and corresponding impact

RQ2. What emotions arise from users' interactions with products designed with information and feedback interventions?

		Observation	Implication
Positive Information		Effective while in place Rated most effective in survey Higher Positive Affect	Immediate behavior change, but did not to alter habits Evoked positive emotion
Negative Information		Effective while in place and several weeks after removal Higher Negative Affect	Potential learning effect that changed habits Evoked negative emotion
Feedback		Did not change behaviors Main message napkins "come from trees" Emotions similar to control	Informative message not enough to change behavior Neutral emotions

Saadi, 2021

"RQ2" was in red. The answers are here in red

Discuss key results

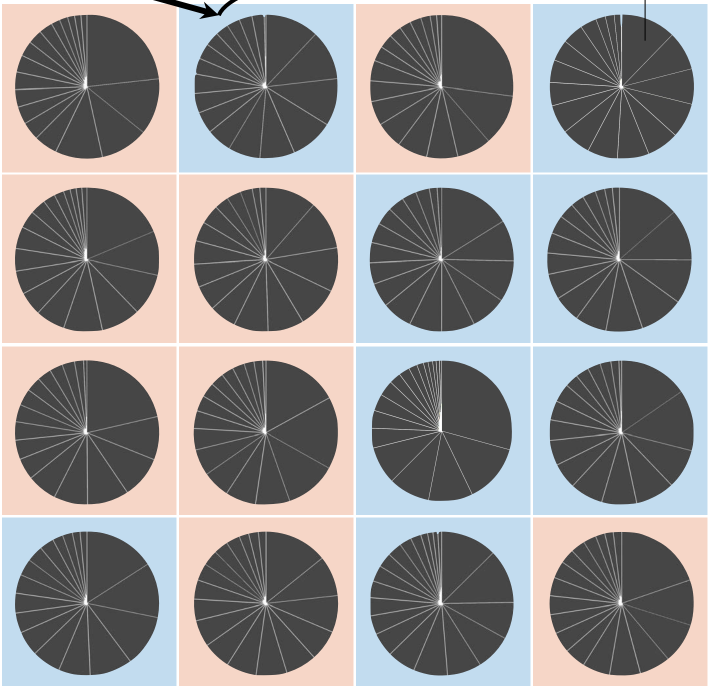
Color is used to link figures and text

Equality of communication might suggest a stronger team process

One slice represents one individual

Use annotations to explain complex plots

Equality of communication by team



σ of stronger teams	σ of weaker teams
4.8	6.1
4.8	4.1
3.1	4.1
4.2	3.5
5.5	3.4
7.0	3
4.4	3.6
3.2	3.6

One-tailed t-test showed that stronger teams had higher communication equalities

p-value of 0.11

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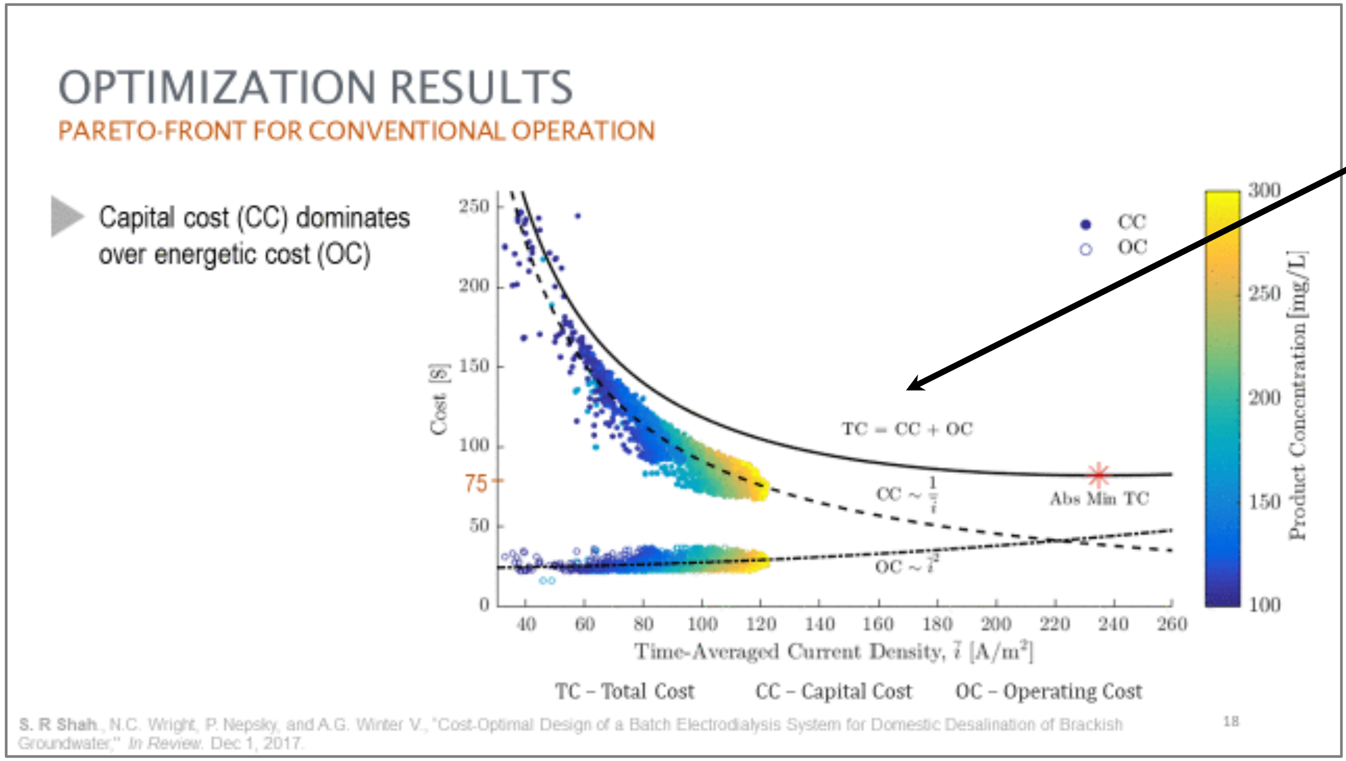
Details of the method are present but concise

Discuss key results

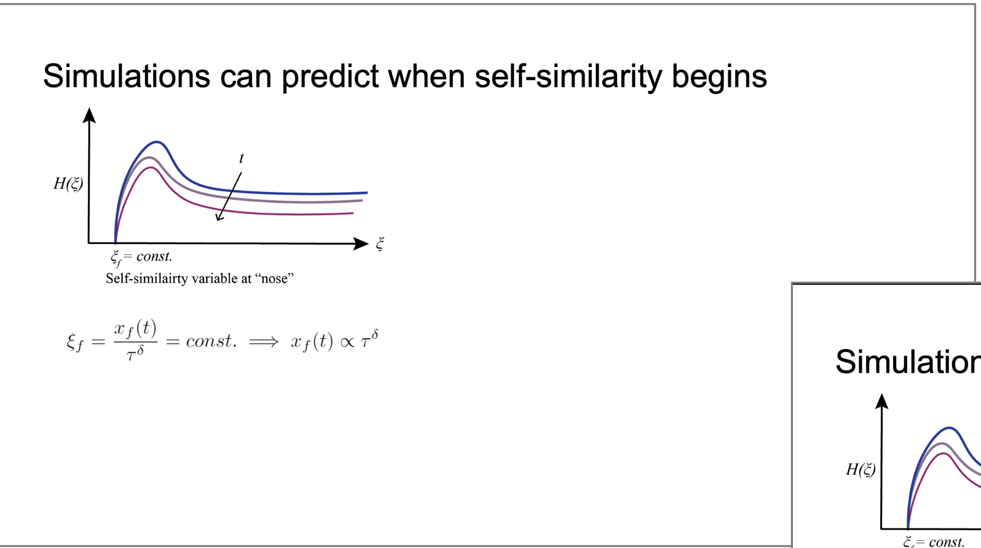
- Avoid merely stating or listing out all the results
- Interpret key results and contextualize their significance

Convey ideally one message per slide

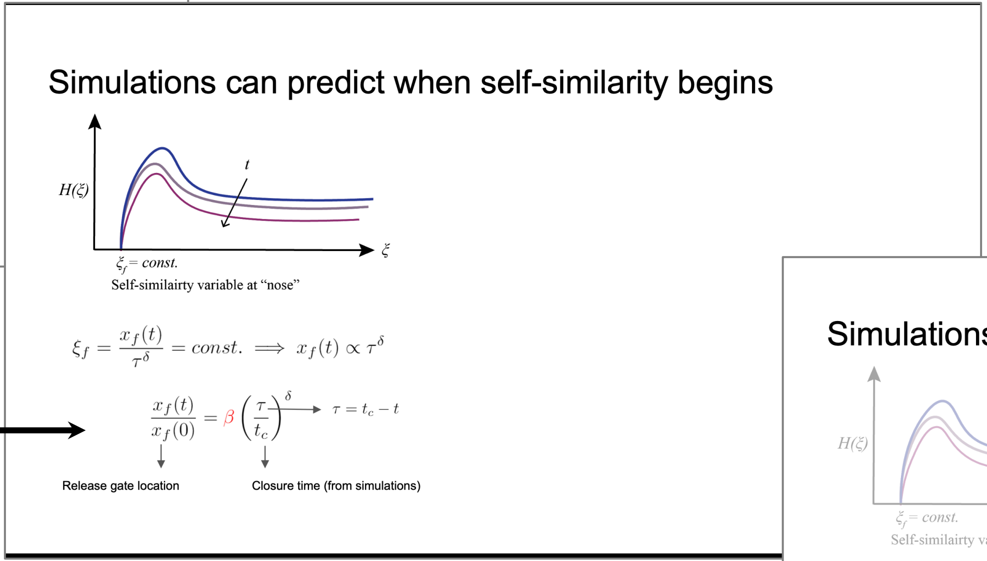


Sometimes annotations can be more helpful than a legend (unless it gets too busy)

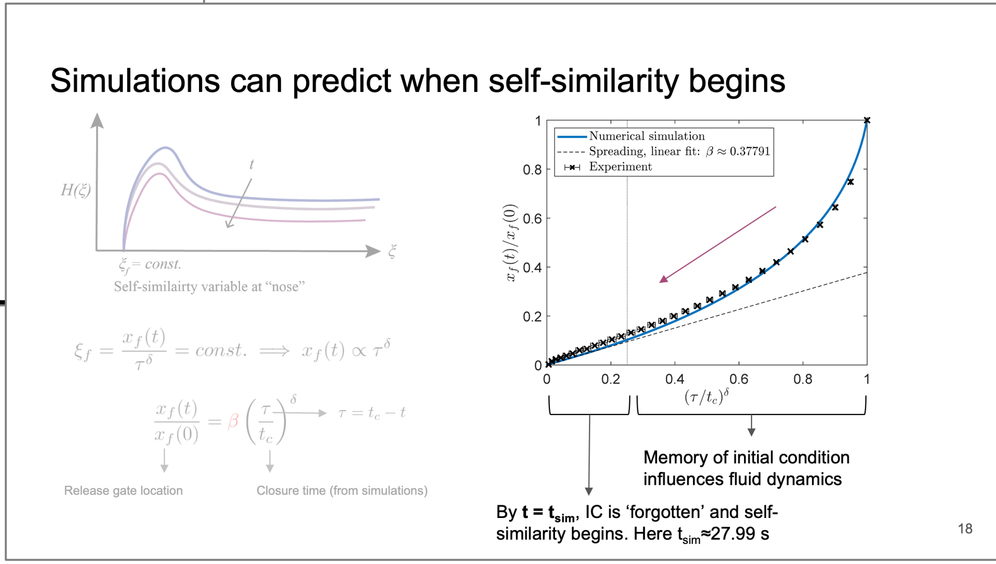
Use builds to introduce information in a logical flow



Which would you rather see right off the bat?



Adding bit of information at a time helps control the audience's focus

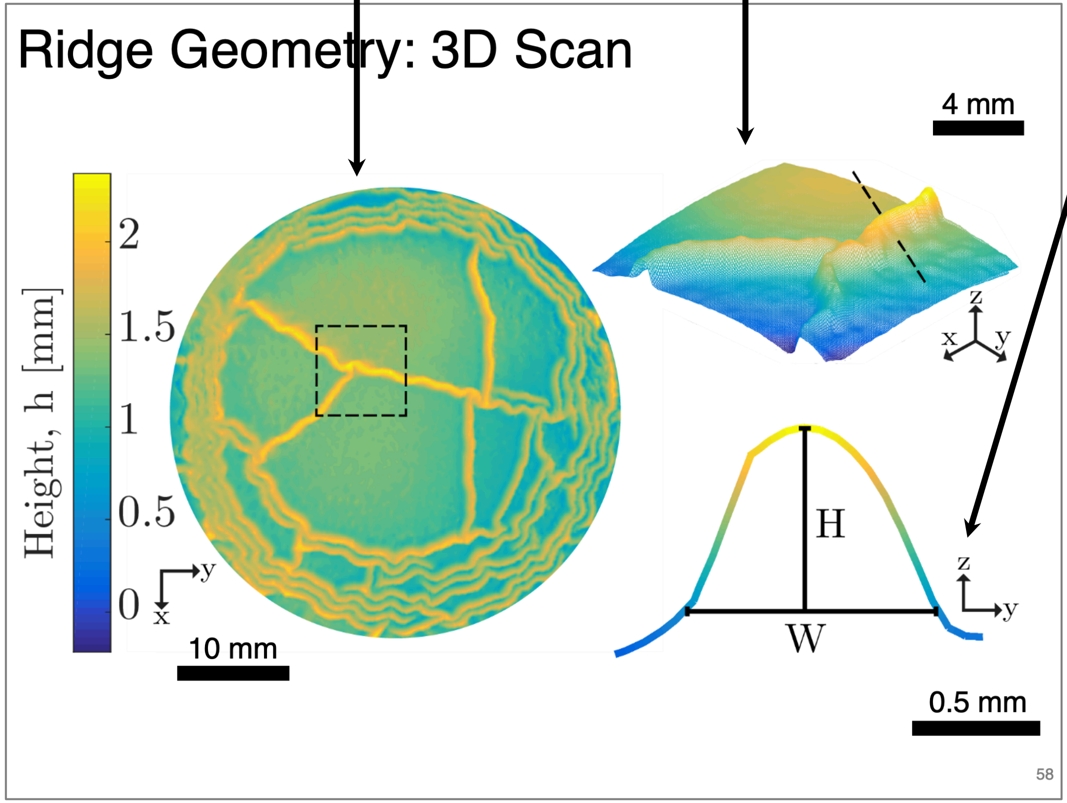


Use visuals to give context before a conclusion

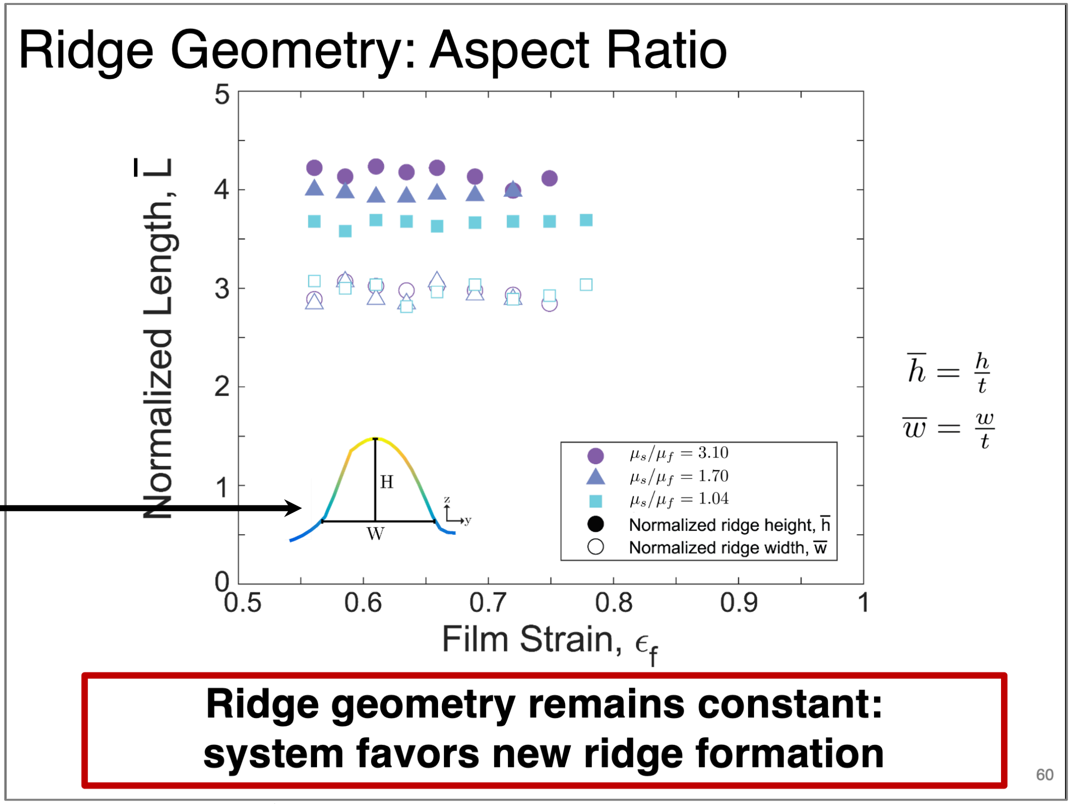
Zoomed out

Zoomed in

Zoomed in more



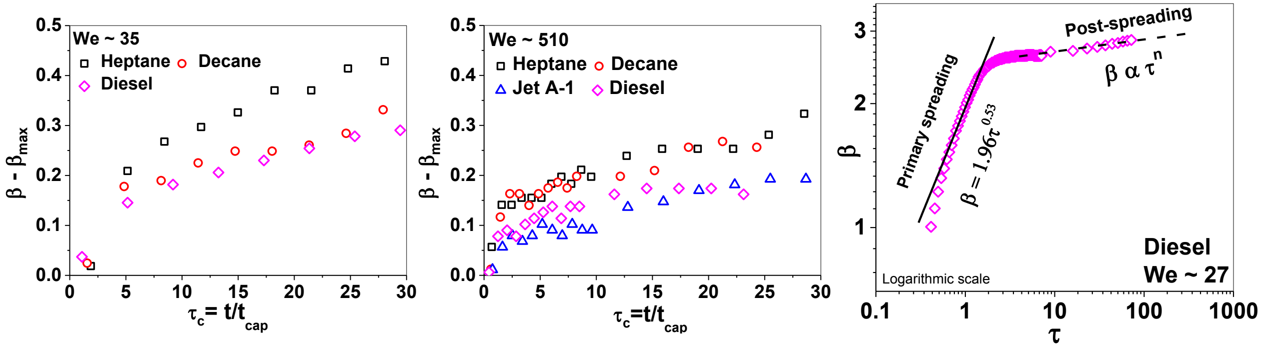
Repeated on next slide



Finally the conclusion!

Say your main points a few times, in a few ways

Temporal variation of the spreading diameter in the post spreading phase



- In order to determine the post spreading rate, curve fitting analysis was performed on the post spreading phase

$$\beta \sim \tau^n$$

A power law fit is found to be the best fit for the post spreading phase

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Key result visually distinct from slide content

Simple and impactful restatement of key results at the conclusion

Conclusions

Objective 1-To study the effect of surface temperature and fuel properties on the fuel drop spreading process:

- Drop spreading morphologies were investigated for the four fuels impacting on a solid surface at varying temperatures
- Dependency of maximum diameter on surface temperature and fuel properties was explored
- Spreading of fuel drops beyond inertia driven regimes was investigated

Objective 2- To evolve a detailed understanding of the single fuel drop spreading process on a hot substrate that can be used for studying fuel spray impact processes in engines

- Simple empirical model for determining maximum diameter of spreading for fuel drop impacting on surface at given temperature was proposed
- The validity of highly viscous drop spreading models for post-spreading analysis was examined

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