New Mexico

Governor's STEM Challenge

STEM CHALLENGE

THE NUTS & BOLTS

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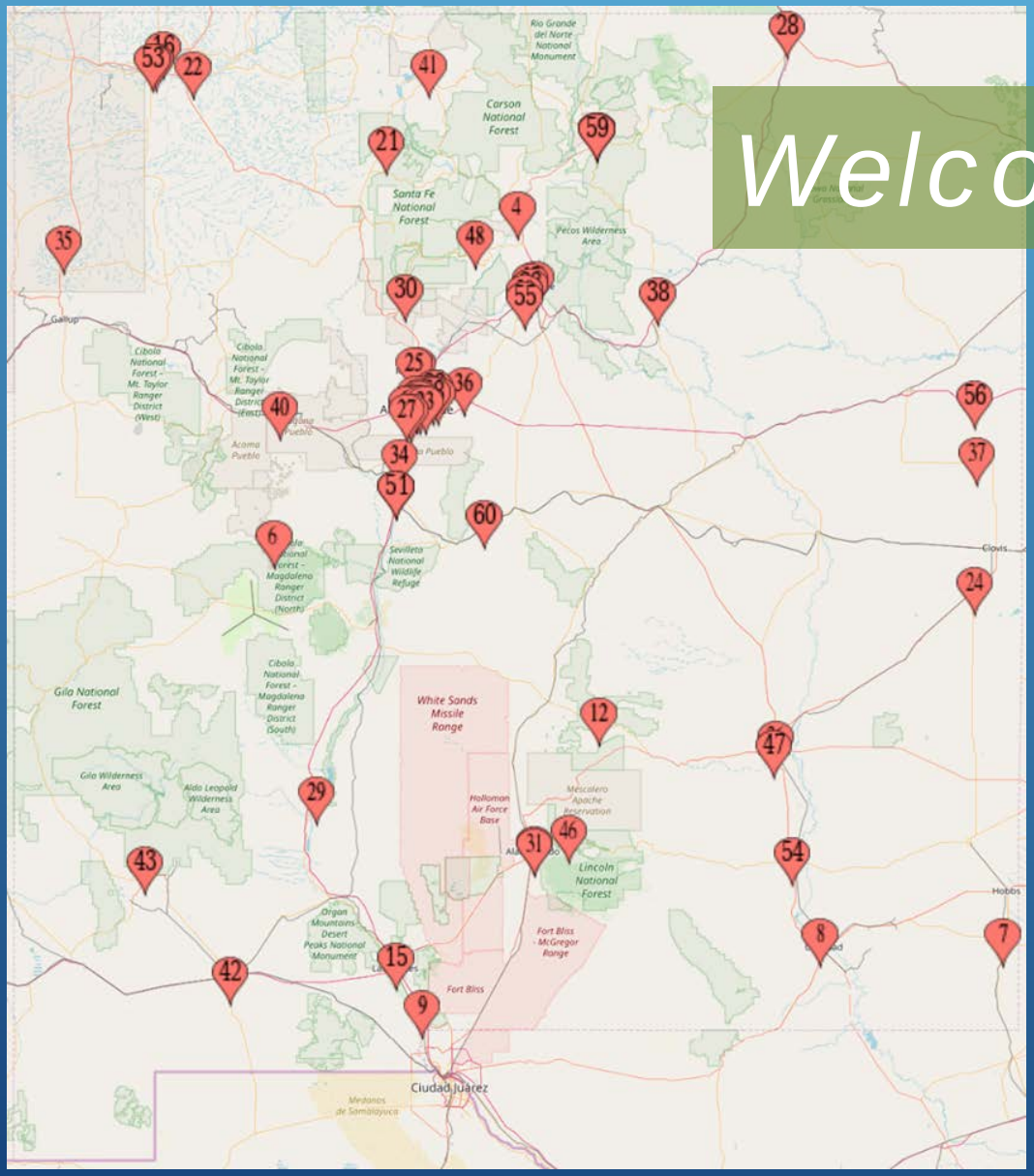
OVERVIEW

- Criteria refresher
- Challenge question & subtopics
- Proposal submission components
- Grading & evaluation
- Statewide showcase
- Resources

WHERE ARE YOU FROM?



Welcome!

CRITERIA: A QUICK REFRESHER

1) Select

10-person student teams

2) Design

& build model solution

3) Submit

proposal packet

4) Present

at Statewide Showcase

CHALLENGE THEME

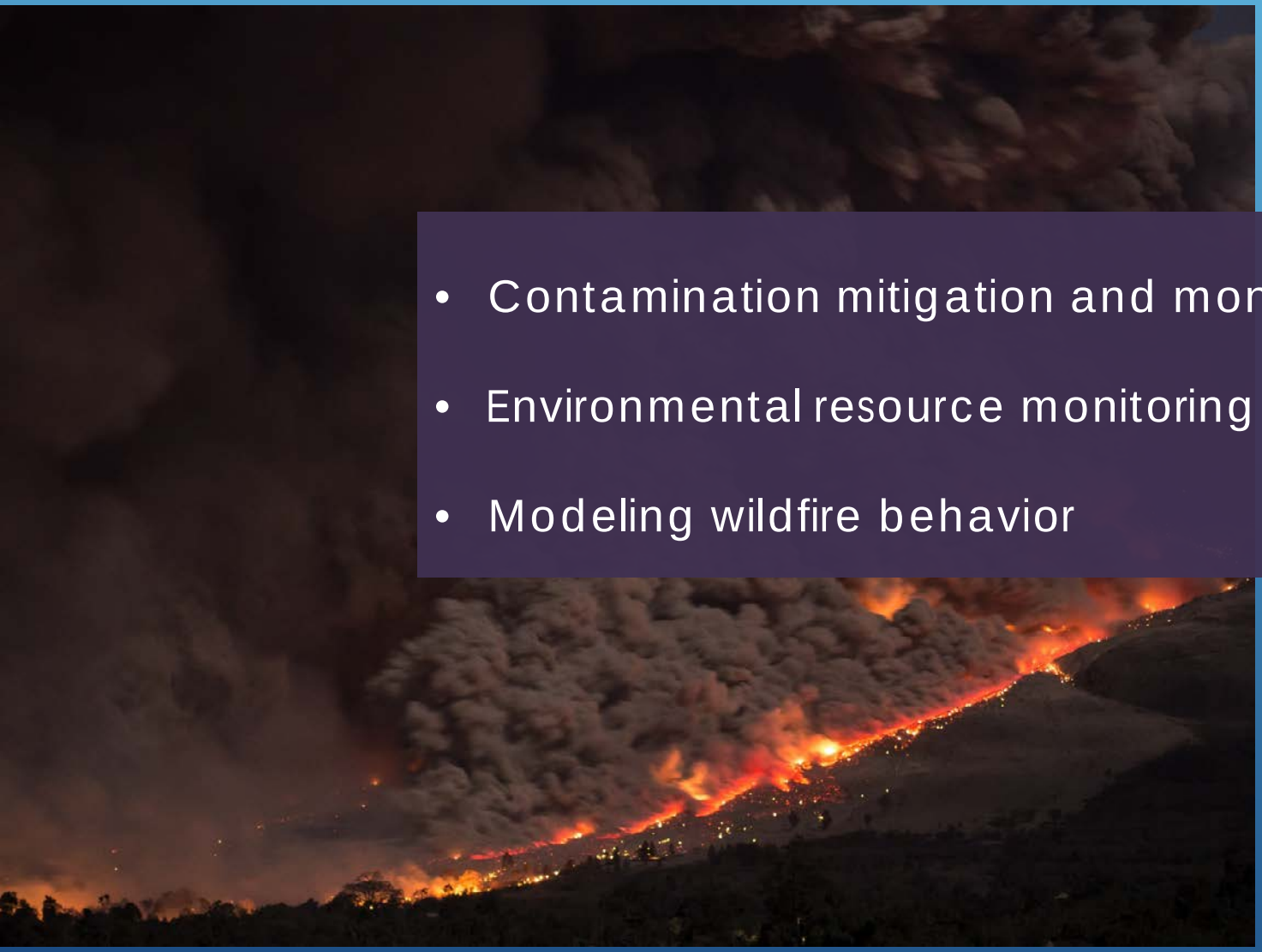
"How would you use technology to make the world a safer place?

TOPIC #1: PROTECTING FROM NATURAL & MAN-MADE DISASTERS

Protecting from Natural & Man-made Disasters

- Illicit materials tracking
- Nuclear operations monitoring
- Asteroids impact prediction
- Natural disaster impact prediction and monitoring
- Earthquake prediction

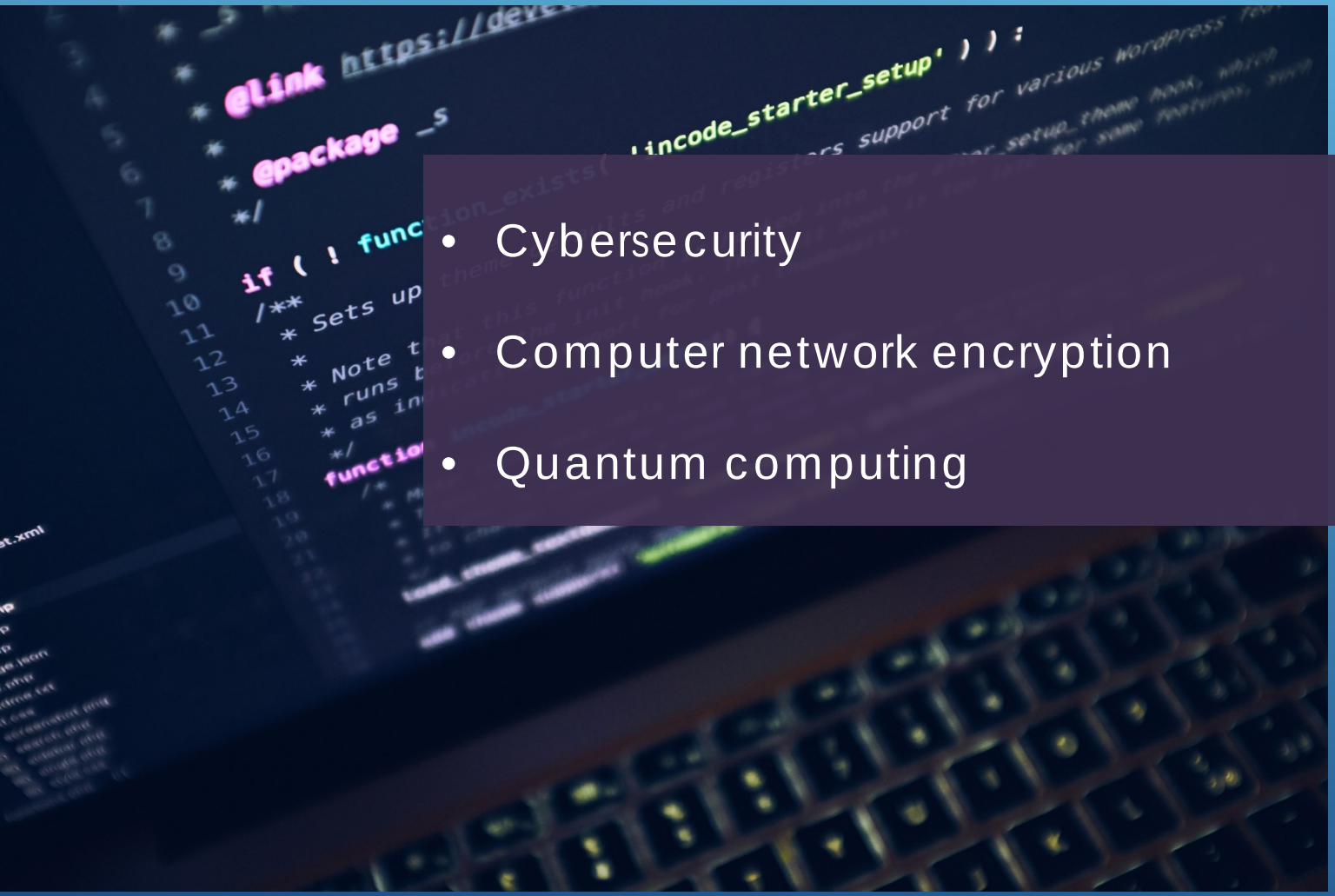
TOPIC #2 : CONSERVING THE ENVIRONMENT



Conserving the Environment

- Contamination mitigation and monitoring
- Environmental resource monitoring
- Modeling wildfire behavior

TOPIC #3: SECURING INFORMATION & DATA

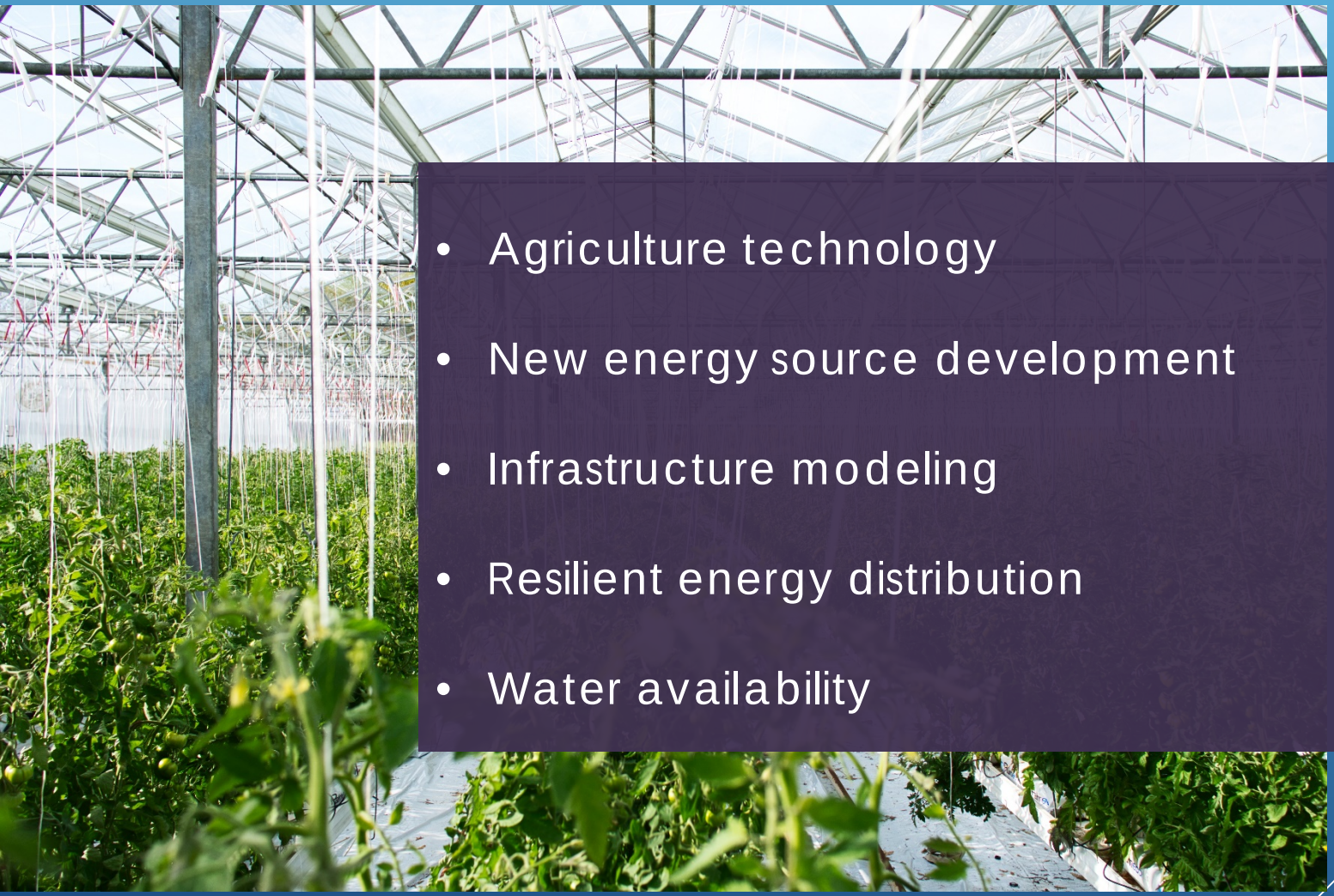


- Cybersecurity
- Computer network encryption
- Quantum computing

TOPIC #4: IMPROVING HEALTH

- Disease outbreaks and organisms monitoring
- Personalized medicine and treatment
- Bioinformatics and biotechnology

TOPIC #5: SAFEGUARDING FOOD, ENERGY, & WATER



- Agriculture technology
- New energy source development
- Infrastructure modeling
- Resilient energy distribution
- Water availability

ANATOMY OF THE PROPOSAL PACKET

1) Executive summary

- One-page “elevator pitch”
- Skillset demonstrated: conciseness and focus

2) Written plan

- 10 pages maximum
- Skillset demonstrated: science writing

3) Slide deck/pitch stack

- Designed to be around ~10 minutes
- Could include photos, diagrams, graphs, etc.
- Skillset demonstrated: visual engagement

EXECUTIVE SUMMARY

1. **Show** the problem in a way that captures attention

2. **Explain** solution and basic findings/results

3. **Anticipate** contradictions/challenges

4. **Compel** reader with future possibilities

SLIDE DECK/PITCH STACK

1. Cover
   - Grab attention
2. Problem
   - No debatable arguments
3. Solution
   - Your prototype model!
4. Demo
   - Video, graphs, sketches, data, etc.
5. Effect/Influence
   - Positive and negative effects if implemented on a large scale
6. Feasibility/Constraints
   - Is this practical? Any unintended effects?
7. Team
   - What does your team contribute?
8. Future Plans
   - Go big!

WRITTEN PLAN

Identify the Problem

- Demonstrate research/background of the problem, including work done by others
- Discuss and clarify constraints
- What was the main goal/mission?

Brainstorming

- Discuss the creative and decision-making processes
- Show the various ideas considered to solve the problem
- Explain why selected approach was taken and why other ideas were not chosen

Model or Prototype

- Describe in detail, paint a picture
- List of materials used (including cost)
- Identify how safety and protocol was observed and followed

Test Model and Evaluate

- Discuss troubleshooting, testing, and redesigning through all iterations
- Discuss strengths and weaknesses of design
- Discuss modifications/refinements made to improve/adjust the design
- Share test results, explain if/how design effectively addresses the problem

Collaboration

- Discuss how the *team* worked on the project
- Communicate how each member contributed

PROTOTYPE CONSIDERATIONS

- Rough model of your solution
  - Smaller in size = better (needs to be transported)
  - Think about presentation: space, power, safety, noise, etc.
- Can be made from reused and repurposed items
  - Cardboard, household supplies, recycling bin items, etc.
  - Resource usage and reusability considerations
- Can be made in a fab-lab or makerspace
  - Great idea, but not a requirement
- If it's not functional…
  - Students need to explain how it c*ould* work
  - And explain why they were unable to make it work
- If your prototype is fully functioning, even better!

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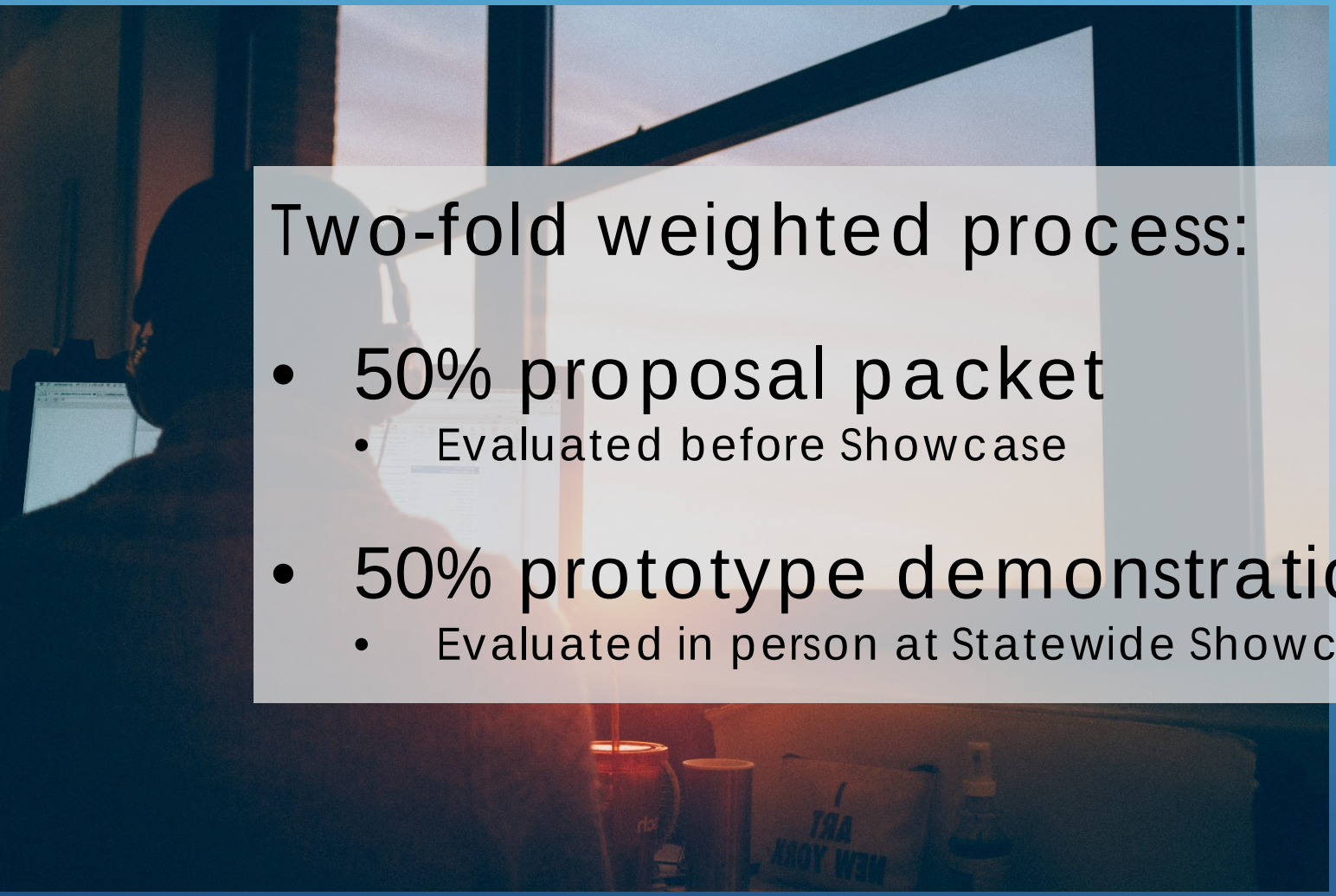
DUE: NOVEMBER 22

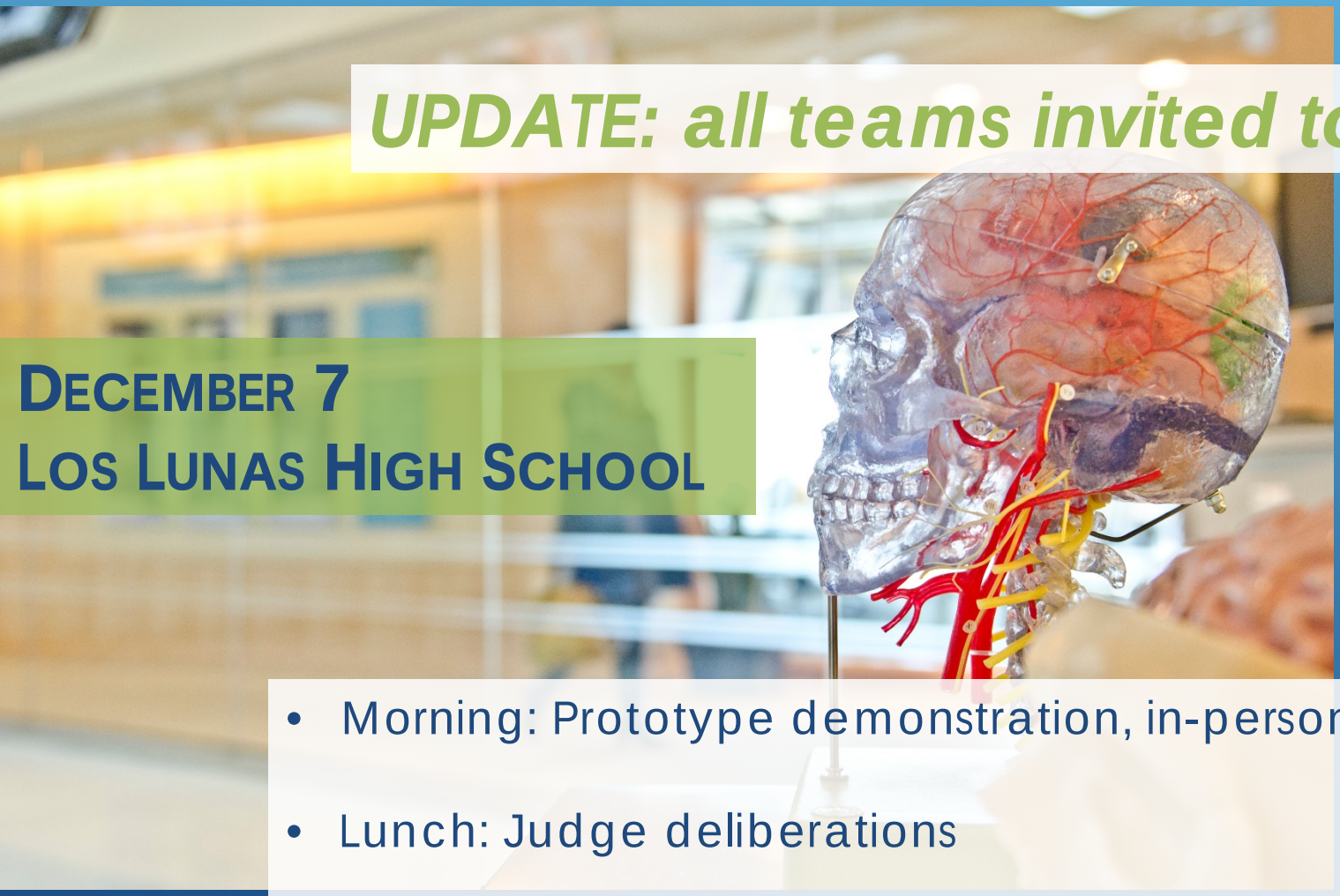
GRADING & EVALUATION



Two-fold weighted process:

- 50% proposal packet
  - Evaluated before Showcase
- 50% prototype demonstration
  - Evaluated in person at Statewide Showcase

STATEWIDE SHOWCASE



UPDATE: all teams invited to present

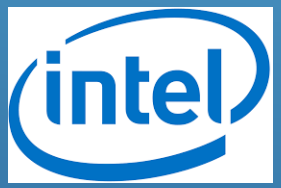
DECEMBER 7
LOS LUNAS HIGH SCHOOL

- Morning: Prototype demonstration, in-person evaluations
- Lunch: Judge deliberations
- Early Afternoon: Award ceremony

INDUSTRY EMPLOYER SPONSORS (AKA JUDGES)

Descartes Labs

Sandia National Laboratories



RESOURCES (WE GOT YOU)!

- Mentor network
  - Request through website
- Materials
  - Reimbursement application process
- Challenge document
  - Live & updated with industry info

QUESTIONS?

Anjeli’s cell: 505-412-9530