

# PHYSICS TO CONSULTING

*And a stop inbetween*

Handwritten physics equations and diagrams on a chalkboard background. The equations include:

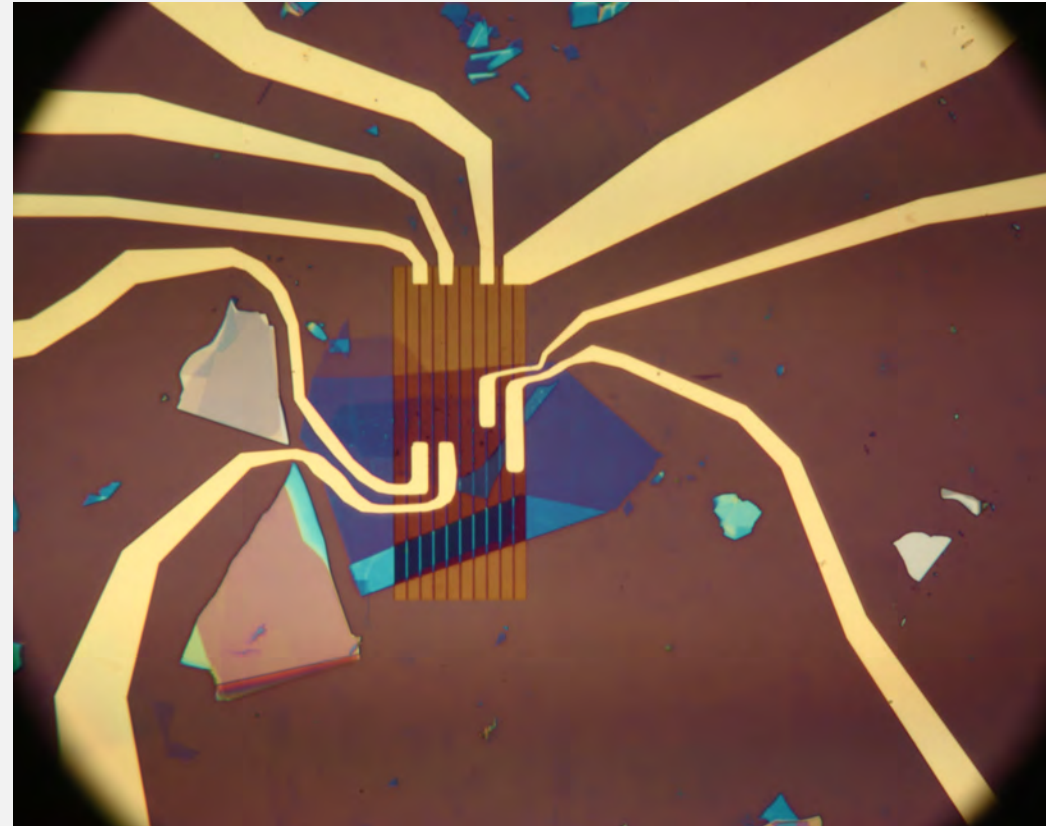
- $\frac{dr}{d\phi} \cdot \frac{\Sigma}{\mu r^2}$  with  $0 < \phi < \pi$
- $\frac{dr}{d\phi} \cdot \frac{\Sigma}{\mu} \frac{d}{dt} \left( \frac{1}{r^2} \right)$
- $-\frac{e}{r^2} \cdot \frac{\Sigma}{\mu} \cdot \left( \frac{dr}{d\phi} \right)^2 \cdot \frac{\Sigma}{\mu r^2}$
- $\frac{1}{r(\phi)} \frac{dw}{d\phi} = -\frac{1}{r'} \frac{dr}{d\phi}; \frac{d^2 w}{d\phi^2} = -\frac{1}{r^2}$
- $\frac{d^2 r}{dt^2} = -\frac{1}{r^2} \left( \frac{\Sigma}{\mu} \right)^2 \frac{d^2 w}{d\phi^2}$
- $= -w^2 G M_1 M_2 + w^2 \frac{\Sigma^2}{\mu} \frac{d^2 w}{d\phi^2}$
- $x^2 + y^2 + z^2 = c^2 t^2$  with  $\beta = \frac{v}{c}$
- $x' = \frac{x - vt}{(1 - v^2/c^2)^{1/2}}$  with  $t' = \frac{t - vx/c^2}{(1 - v^2/c^2)^{1/2}}$
- $E = \frac{Mc^2}{(1 - v^2/c^2)^{1/2}}$  with  $E = Mc^2 + \dots$
- $E^2 = p^2 c^2 + M^2 c^4$  with  $E = (p^2 c^2 + M^2 c^4)^{1/2}$
- $= M^2 c^4 \left[ 1 + \left( \frac{p^2}{M^2 c^2} \right) \right]^{1/2}$  with  $\sum_{i=1}^n E_i = \dots$
- $\Delta t' = \Delta t \sqrt{1 - \frac{v^2}{c^2}}$  with  $E_0 = E + \frac{1}{2} \epsilon + \dots$
- $\frac{dp_x}{dt} = \left( 1 - \frac{v^2}{c^2} \right)^{1/2} \frac{\Delta p_x}{\Delta t}$  with  $\frac{dp_x}{dt} = \frac{dp_x}{dt}$
- $\frac{dp_x}{dt} = \left( 1 - \frac{v^2}{c^2} \right)^{1/2} \frac{dp_x}{dt}$  with  $\frac{v}{c} = \frac{E}{E_0}$
- $\Delta p_x = \frac{\Delta p_x + v \Delta E / c^2}{(1 - v^2/c^2)^{1/2}}$

A diagram shows a sphere with radius  $a$  and a horizontal line through its center. A vertical line segment of length  $b$  is drawn from the center to the top of the sphere. The angle between the horizontal line and the radius is  $\phi$ . The distance from the center to the point where the vertical line meets the sphere is  $2a$ .

# BACKGROUND

## B.S. in Physics in 2016

- Comprehensive Track
- Minor in Applied Math
- Research Assistant in Xu Lab
  - Low Dimensional Quantum Optoelectronic Research Group
- Research Assistant at the Molecular Analysis Facility(MAF)
  - Learned about Electron Microscopy



# ALLEN INSTITUTE FOR BRAIN SCIENCE

## Systems Design Engineer

- Day to day: Built and maintained six custom transmission electron microscopes
- Systems engineering is...
  - An **interdisciplinary** field that focuses on how to design and manage complex systems over their life cycles
  - It utilizes systems thinking principles to organize this body of knowledge



# ARCADIS – DESIGN & CONSULTANCY FOR NATURAL AND BUILT ASSETS

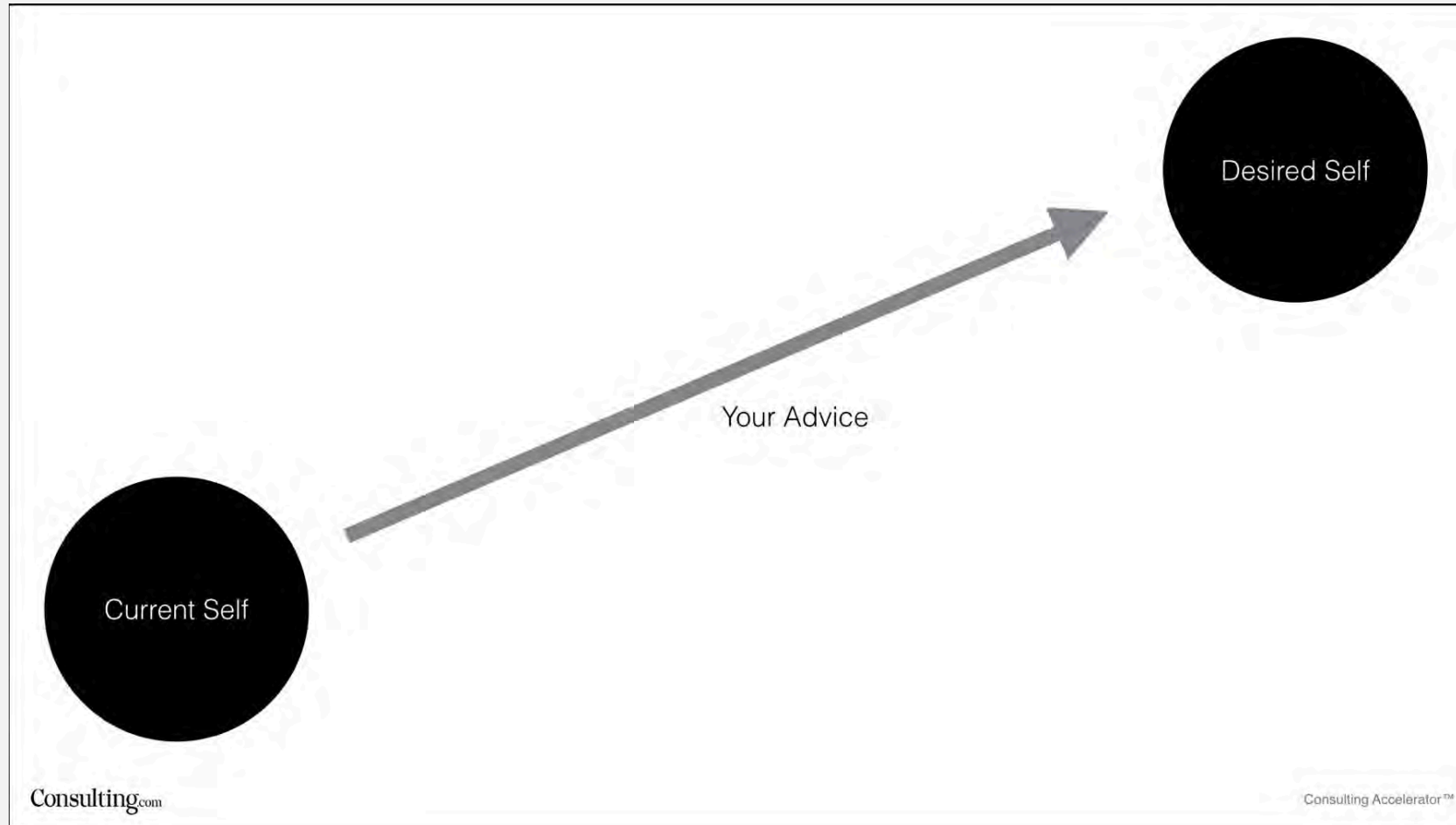
## Management Consultant | Project Manager

- Day to day: Help manage a team of consultants implement commercial enterprise-wide environmental health safety, sustainability, risk and operational excellence software to our clients
- Consulting is...



# DEFINITION OF CONSULTING

Help people **solve problems** and move from their current state to their desired state.



# HOW DOES THIS RELATE BACK TO PHYSICS?

- Physics – Something moves from one state to another and something happens
  - An apple falling from a tree
  - An electron moving from an excited state to a ground state



by Frits Ahlefeldt

# TAKEAWAY

- Physics gives you the confidence and problem-solving skills to tackle and solve any problem in any medium
  - I solve problems people didn't know they have