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S. T. E. M. EXPERIENCE

TODAY'S AGENDA

- PHYSICS DEMO
- PRESENTATION
- STEM ACTIVITIES
- FLY!!!
- WRAP UP

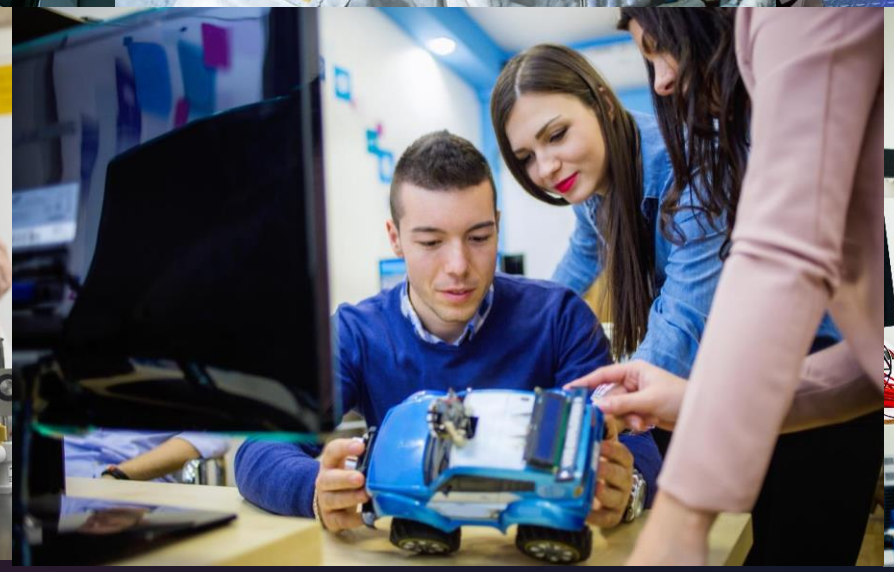
WHAT IS STEM?

- SCIENCE
- TECHNOLOGY
- ENGINEERING
- MATH

EXCITING FUTURES IN STEM








BLS periodic table of science, technology, engineering and mathematics (STEM) occupations

The periodic table of chemical elements, created by Dmitry Mendeleev in 1869, is one of the most important achievements in modern science. To celebrate this achievement, BLS has created our own periodic table! Instead of elements, we have used Science, Technology, Engineering and Math (STEM) occupations. Workers in STEM occupations use science and mathematics to understand how the world works and to solve problems.

STEM GROUP

- Chemistry
- Computer Science
- Engineering
- Environmental Science
- Geosciences
- Life Sciences
- Mathematics
- Physics/Astronomy

Typical education needed for entry | Employment Change, projected 2018–28 | Median annual wage

Ex — Example occupation

Symbol	Typical education needed for entry	Employment Change, projected 2018–28	Median annual wage	Occupation
Ch	Bachelor's	3.7%	$78k	Chemists
Cm	Bachelor's	11.3%	$146k	Computer and information systems managers
Cp	Doctoral or professional	6.3%	$80k	Chemistry teachers, postsecondary
Et	Associate's	1.7%	$49k	Chemical technicians
Cn	Bachelor's	5.3%	$113k	Computer network architects
Pp	Doctoral or professional	6.5%	$90k	Physics teachers, postsecondary
Is	Bachelor's	31.6%	$100k	Information security analysts
As	Doctoral or professional	4.7%	$115k	Astronomers
Ce	Bachelor's	6.3%	$109k	Chemical engineers
Me	Bachelor's	4.1%	$88k	Mechanical engineers
Ct	Associate's	5.0%	$53k	Civil engineering technicians
En	Bachelor's	8.2%	$71k	Environmental scientists and specialists, including health
Pt	Associate's	9.2%	$47k	ES and protection technicians, including health
Ep	Doctoral or professional	6.0%	$82k	Environmental science teachers, postsecondary
Ge	Bachelor's	5.7%	$92k	Geoscientists, except hydrologists and geographers
Ph	Doctoral or professional	9.5%	$123k	Physicists
So	Bachelor's	7.6%	$63k	Soil and plant scientists
Mi	Bachelor's	4.9%	$76k	Microbiologists
Ep	Master's	5.3%	$71k	Epidemiologists
Ac	Bachelor's	20.1%	$108k	Actuaries
Ma	Master's	26.0%	$105k	Mathematicians
Sa	Master's	30.7%	$91k	Statisticians
Gt	Associate's	6.6%	$51k	Geological and petroleum technicians
Hy	Bachelor's	6.5%	$81k	Hydrologists

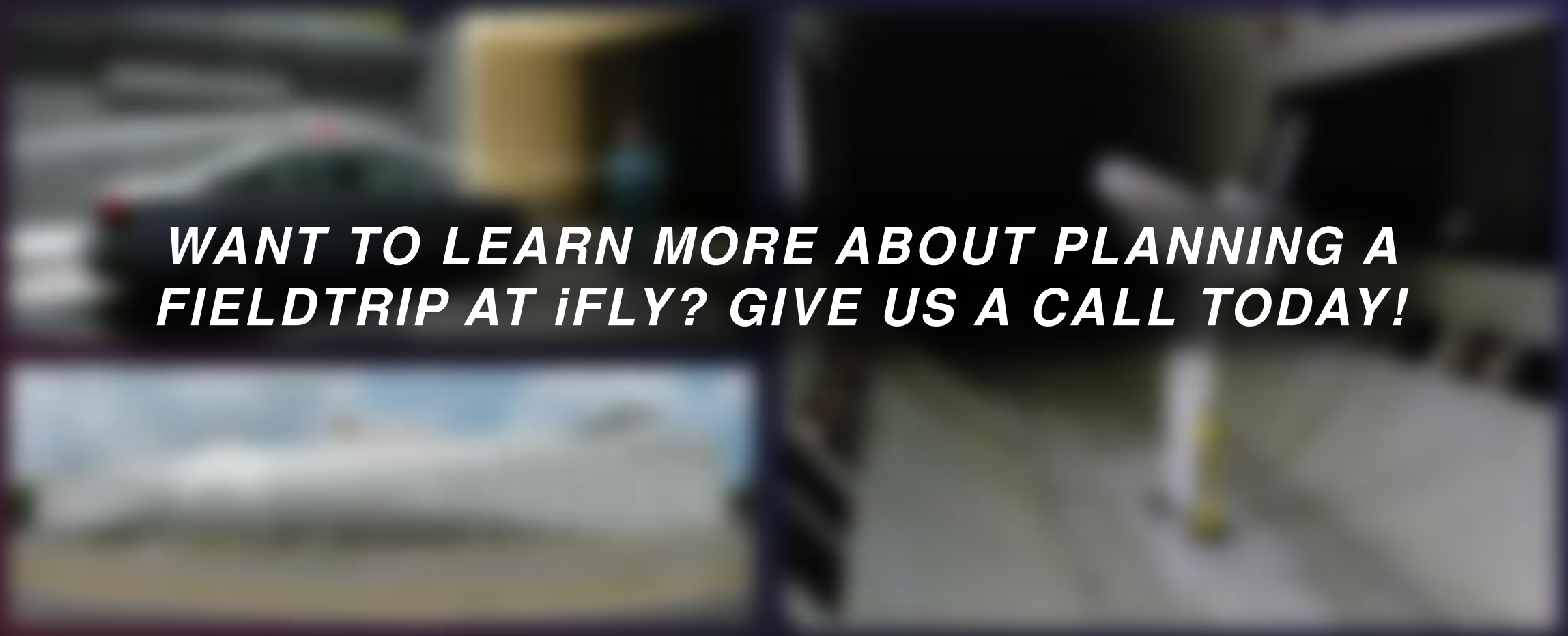
BLS U.S. Bureau of Labor Statistics

The BLS would like to thank the Nebraska Department of Labor for the original idea for this table.

SOLVE REAL PROBLEMS

STEM is used in the real world to solve problems and improve lives.

WIND TUNNEL TESTING



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WIND TUNNEL TESTING

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WE MAKE STEM FUN!

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iFLY WIND TUNNELS

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NEWTON'S LAW OF INERTIA

An object in motion wants to stay in

to stay at rest until acted on by an unbalanced force.

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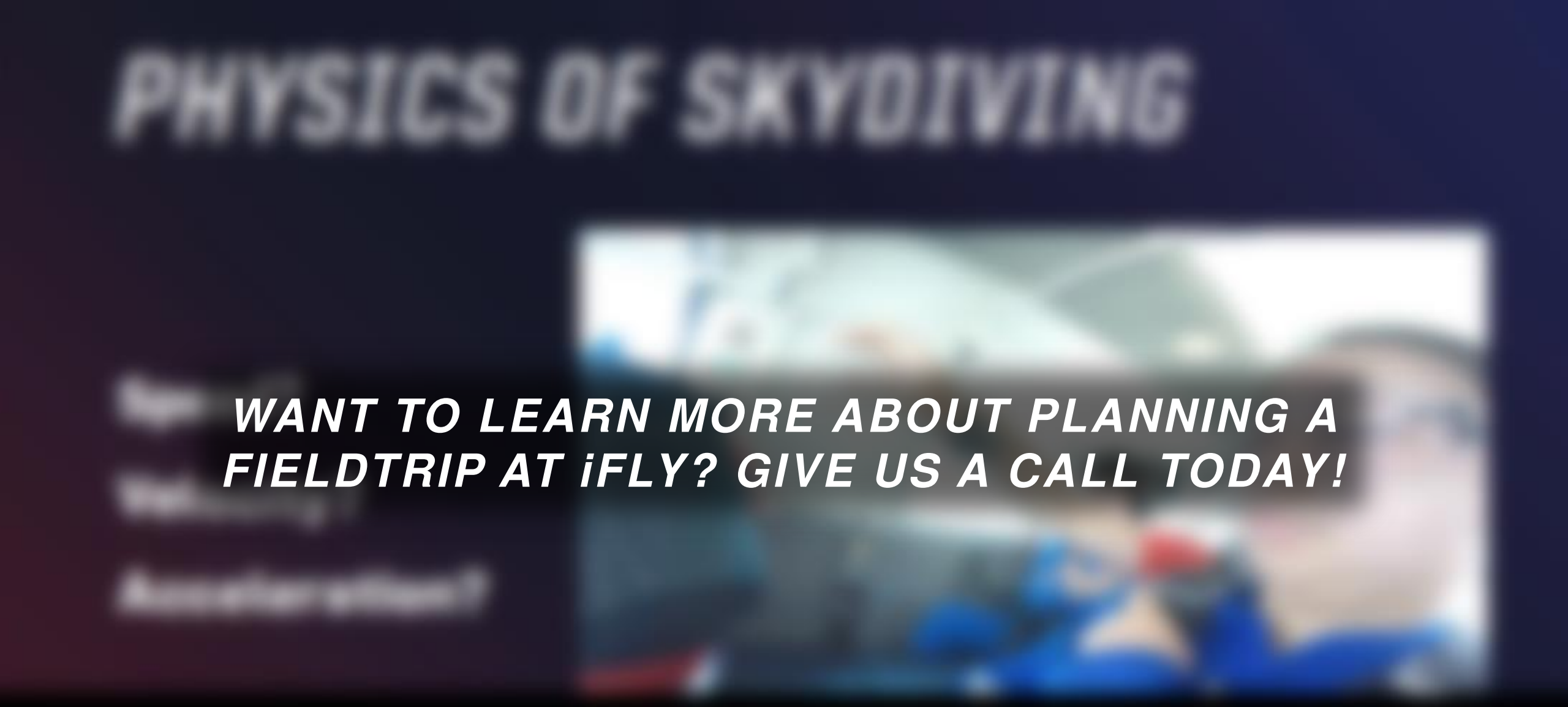

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PHYSICS OF SKYDIVING

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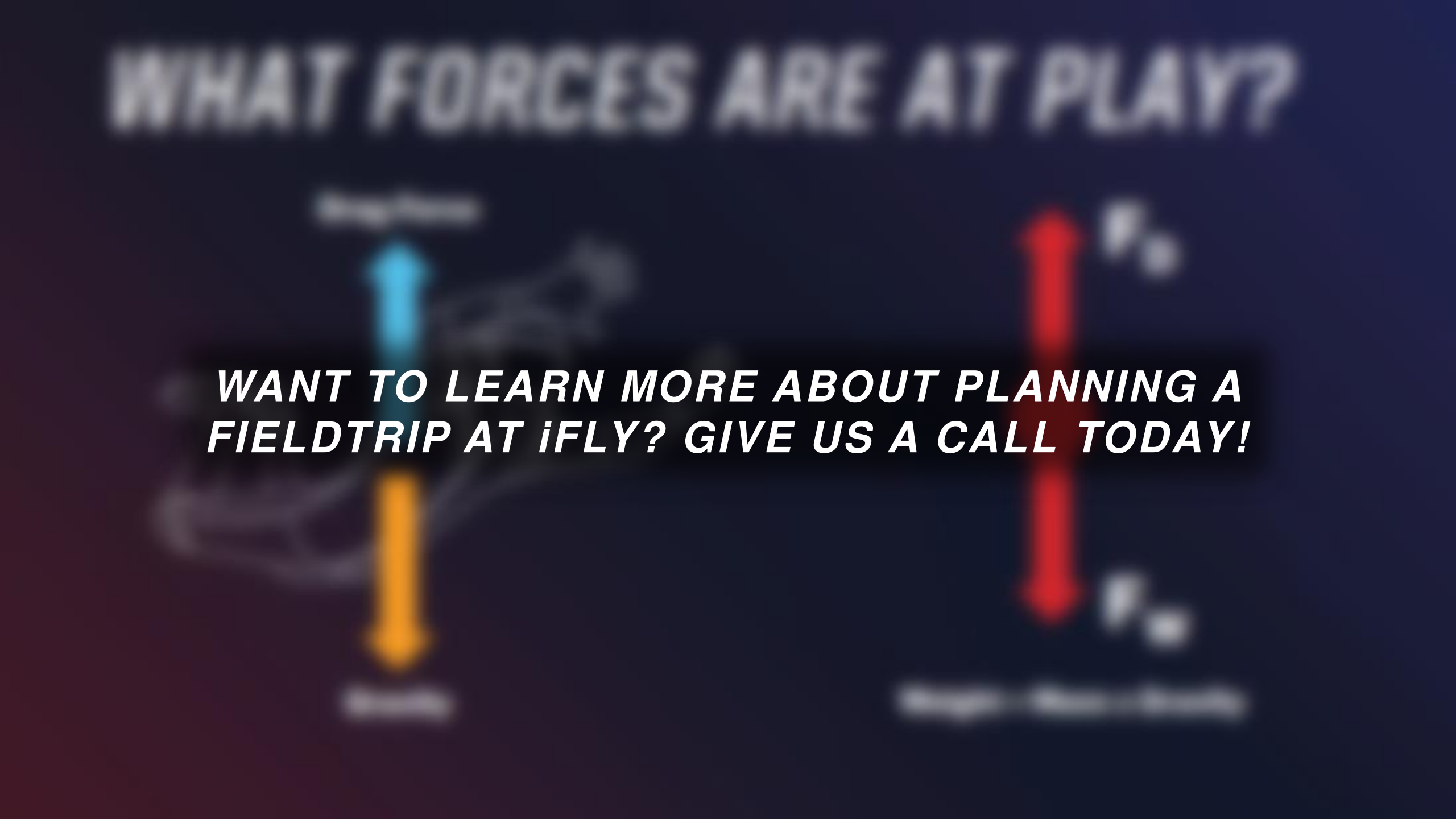
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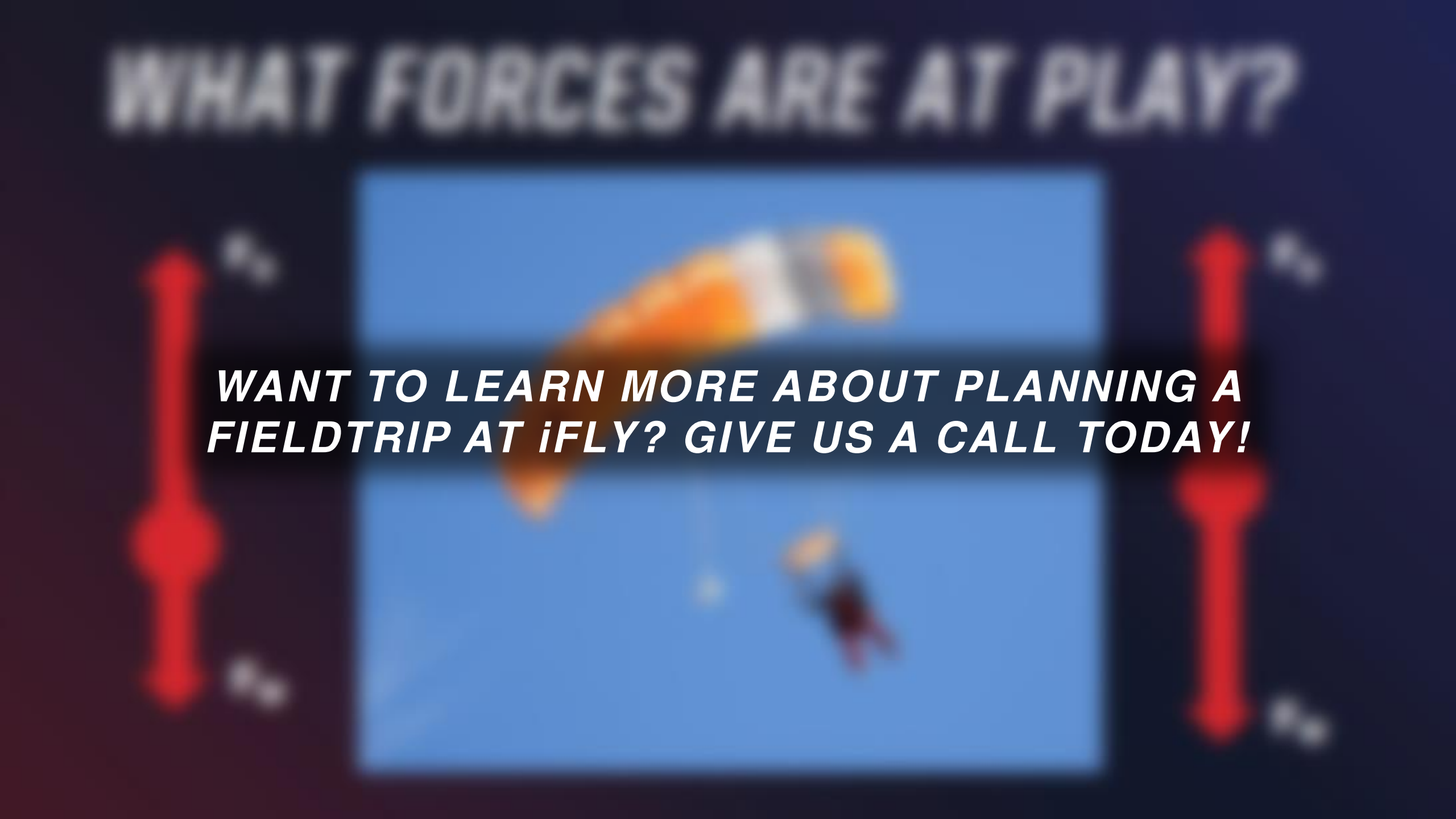

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INDOOR VS. OUTDOOR

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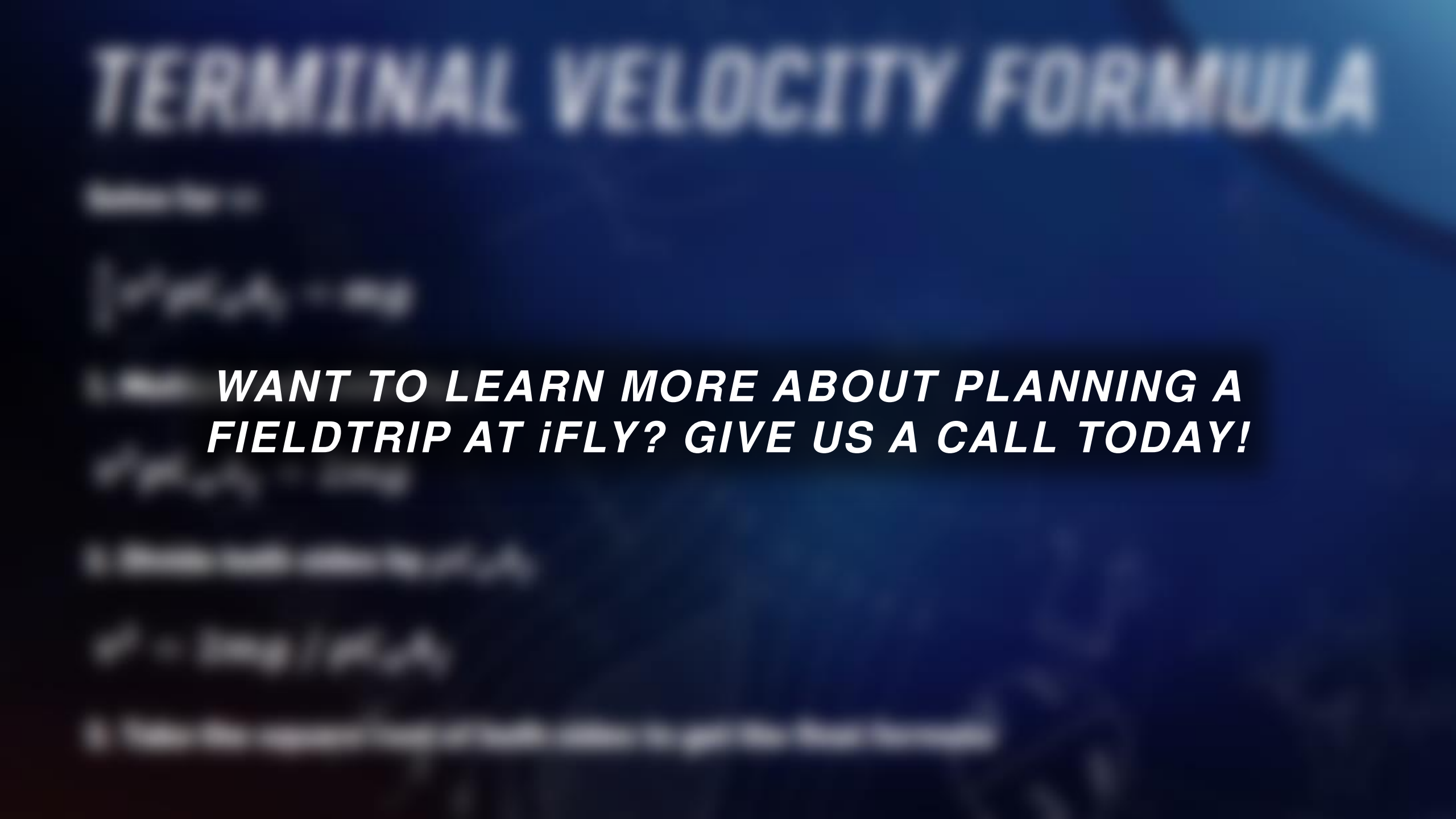

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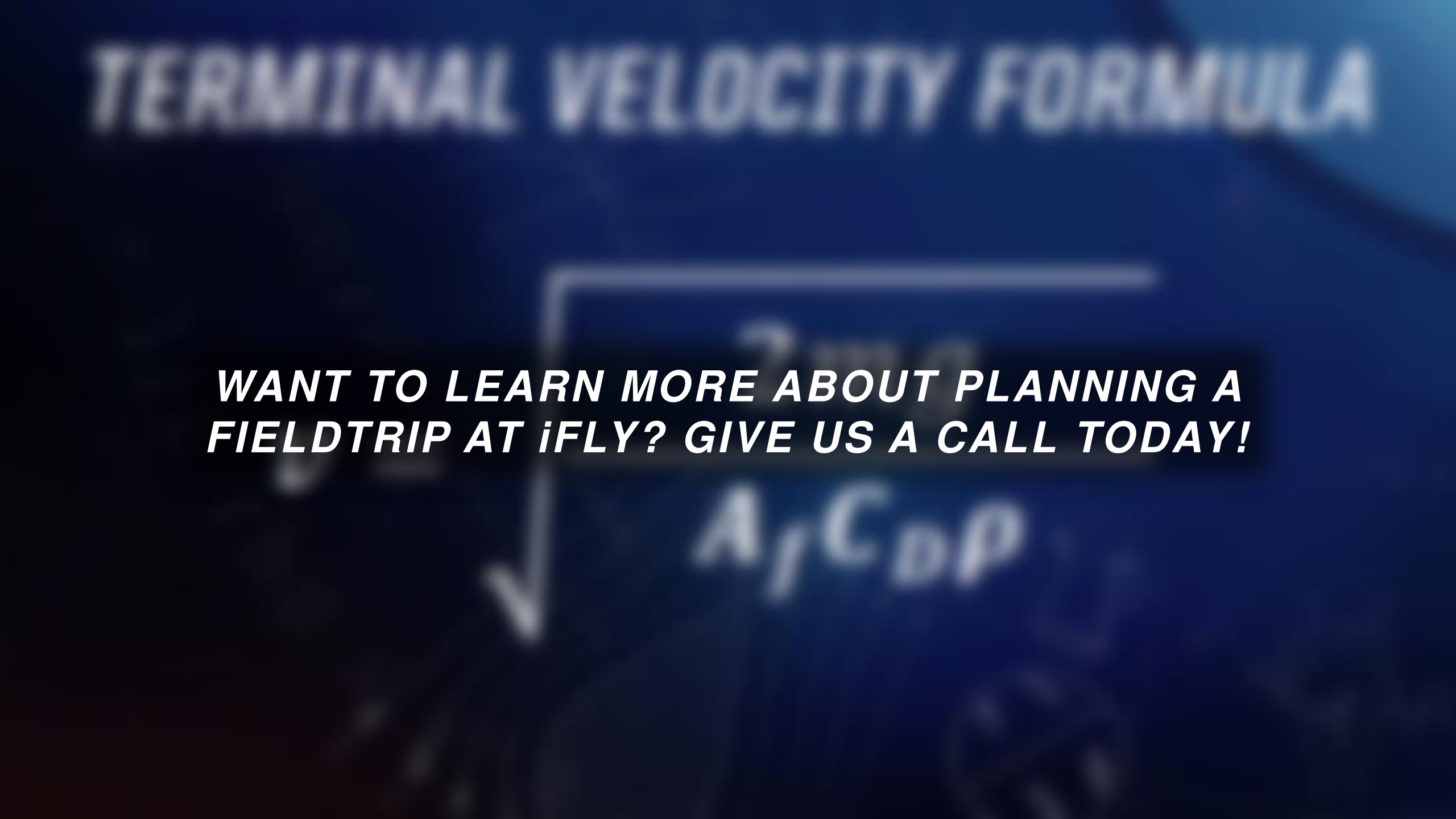

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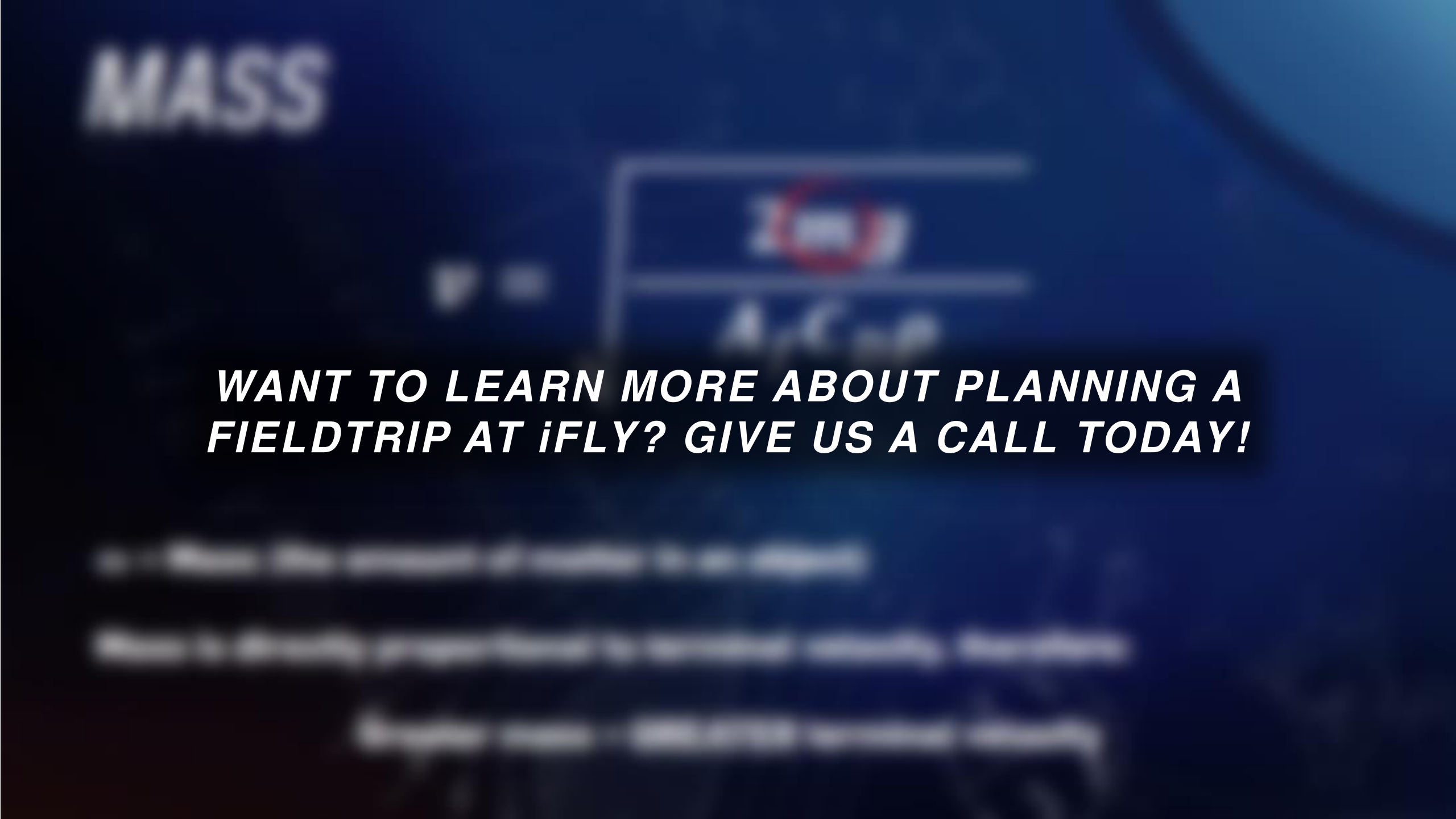
MASS
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GRAVITY
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FRONTAL AREA

$$v_t = \sqrt{\frac{2mg}{\rho A C_d}}$$

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A_f = Frontal Area (the portion of an object that the wind can push on at any given time)

Frontal area is linearly proportional to terminal velocity, therefore

Doubling frontal area = 100% terminal velocity

FRONTAL AREA

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Frontal Area dependent on family profiles.

DRAG COEFFICIENT

$$v = \sqrt{\frac{2mg}{A\rho C_D}}$$

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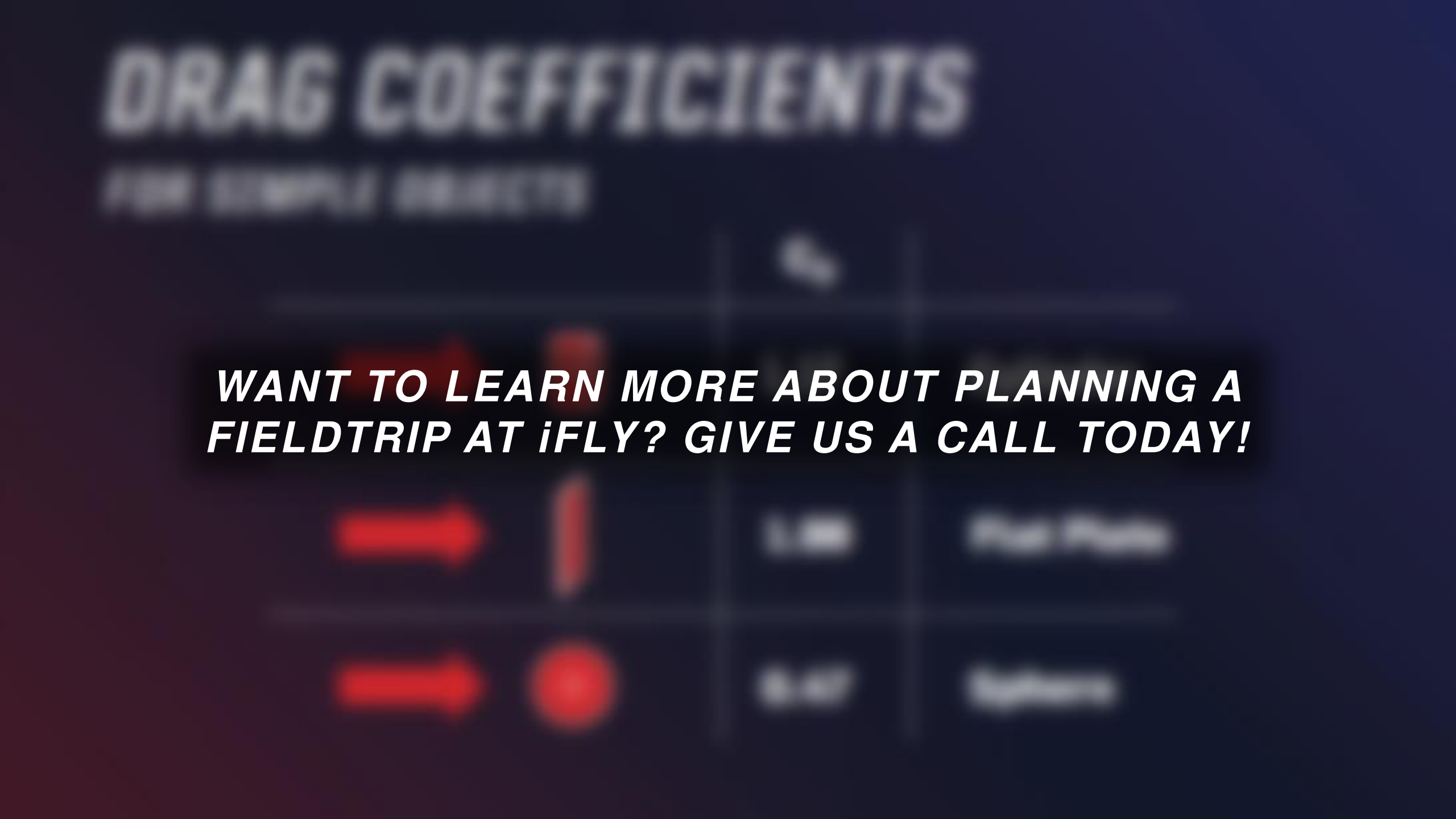
C_D = Drag Coefficient (dimensionless, experimentally determined number based on the shape of an object).

Drag Coefficient is inversely proportional to terminal velocity, therefore

Lower drag coefficient = [illegible] terminal velocity


DRAG COEFFICIENTS
FOR SIMPLE OBJECTS
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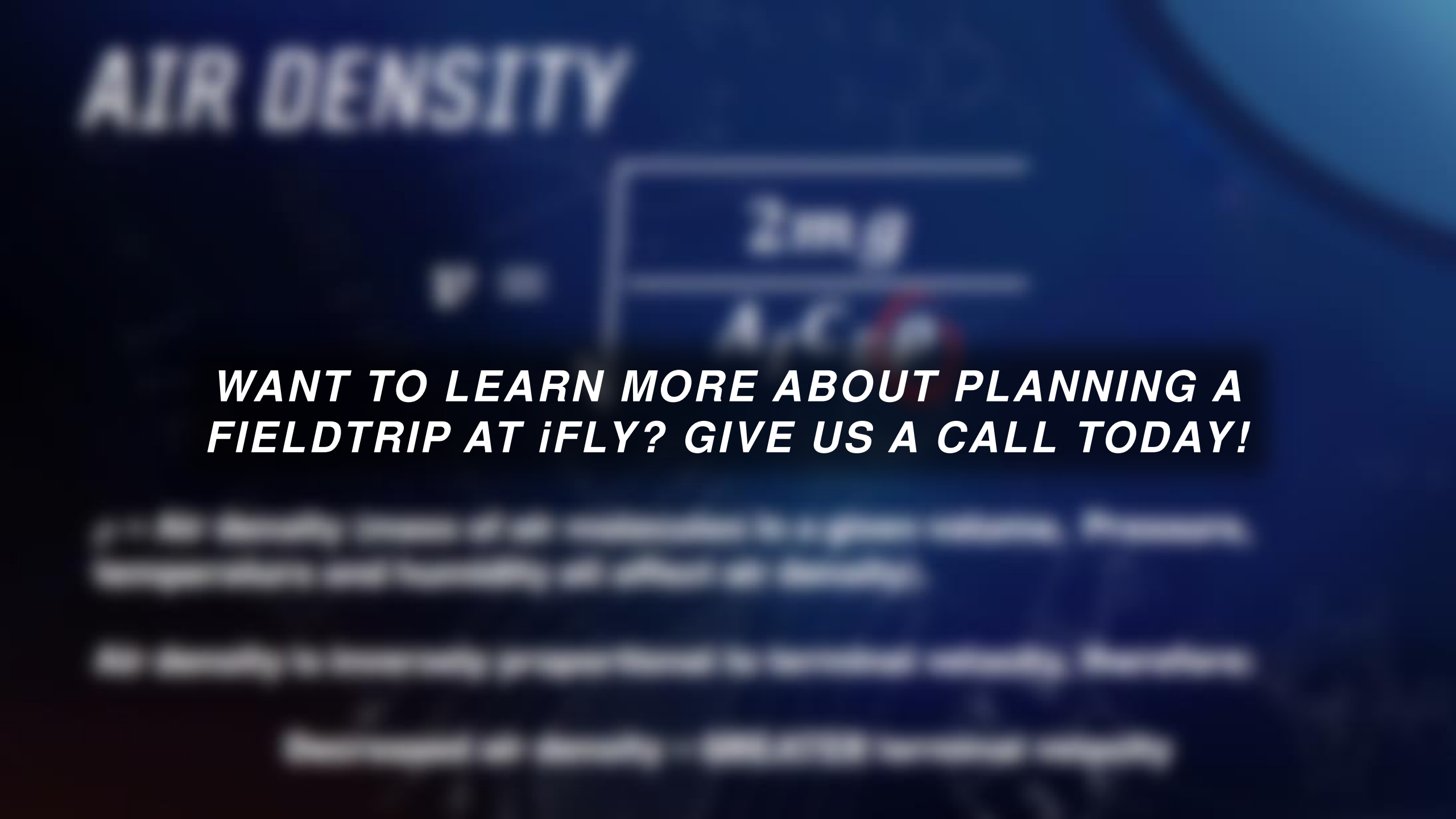

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QUESTIONS?

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