Glossary

Ah-Ha Moment: A moment of sudden inspiration that helps one solve a problem, create a new, novel idea, or spark an important realization.

Atmospheric Pressure: The force we feel standing on the surface of the earth due to the weight of air molecules in the atmosphere pushing down on us.

Chemical Energy: The innate energy stored within a fuel source that can be released when burned.

Combustion: A reaction where a fuel source is burned alongside a source of oxygen (an oxidizer) to produce exhaust as well as light, heat, and energy.

Conic Section: A shape created by taking the cross section of a cone, which results in four possible types of curves: circles, ellipses, hyperbolas, and parabolas.

Cryogenic: A term used to describe liquids (liquid fuels, for example), at extremely cold temperatures

Dopants: compounds added to solid-fuel mixtures in order to slow and control the rate of combustion.

Escape Energy: The amount of energy needed to escape out of a given gravitational well.

Gradient: An operation that takes in a multi-dimensional function and returns a vector field that points in the direction of steepest ascent for every point in the domain of that function.

Gravitational Wells: Pockets of negative potential energy created by massive objects that create the sensation we feel as the force of gravity.

Momentum: An objects mass times its velocity (mv), which also describes how difficult it is to stop something from moving.

Newton's Second Law: F = ma – Objects with more mass take more force to be accelerated forwards

Newton's Third Law: Every action has an equal and opposite reaction.

Nozzle: The back end of the rocket that allows exhaust to flow out and push against it to create the forward thrust.

Nuclear Fission: A process in which atoms themselves are split into smaller nuclei in order to release huge amounts of energy.

Propulsive Landing: A technology built in to many rockets that allows the first stage of the rocket to land back on earth after being discarded from the rocket in order to be useable.

Specific Impulse: A measure of the efficiency of rockets that describes how long a given rocket can maintain a baseline level of thrust.

Solar Sail: A large, thin, (usually) metal sheet attached to a spacecraft that lets sunlight bounce off of it in order to produce forward thrust

Tensor: A mathematical object that can be described by a 4d-matrix.

Throttleable: A rocket that is able to increase or decrease the amount of thrust it is able to provide by speeding up or slowing down combustion.

Turbopump: A device used in rocket engines that rotates at extremely high speeds in order to transport fuel and oxidizer into the combustion chamber.