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# DRONE OPERATION COURSE FOR CARGO AND PEOPLE TRANSPORT

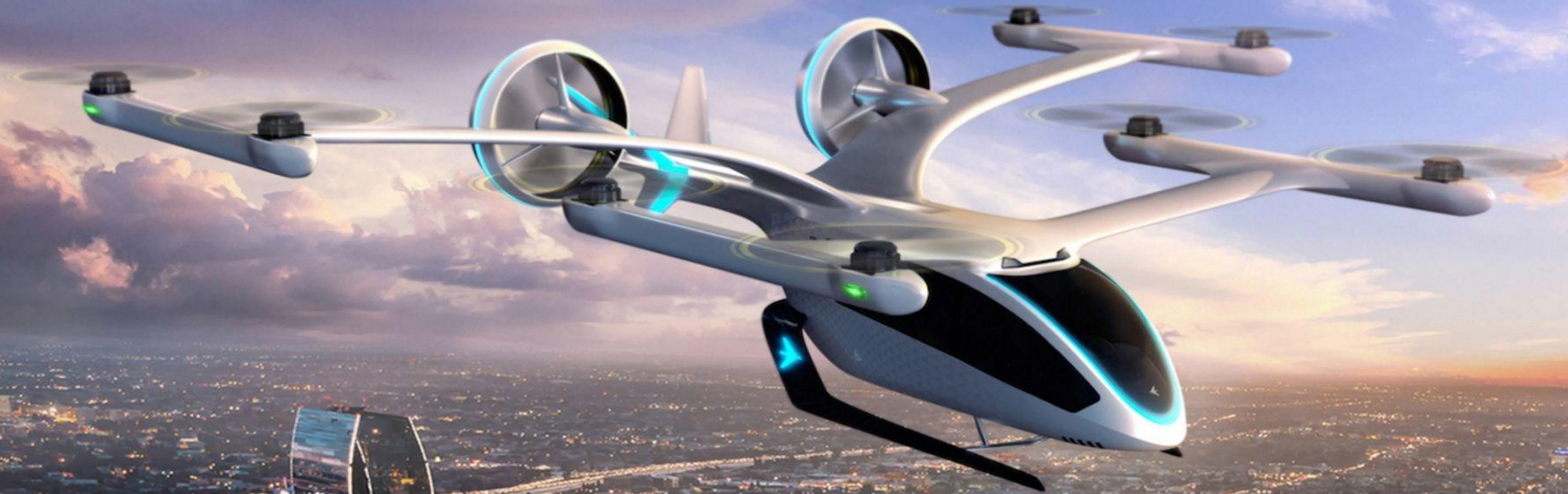


# CARGO TRANSPORT



**DRONESVIP** | CIVIL AERONAUTICAL  
TRAINING CENTER

# PEOPLE TRANSPORT



**DRONESVIP** | CIVIL AERONAUTICAL  
TRAINING CENTER



# CHAPTER III: TECHNICAL CHARACTERISTICS AND CAPABILITIES



# TECHNICAL CHARACTERISTICS AND CAPABILITIES

"TECHNOLOGICAL REVOLUTION IN MOTION"



CONVERGENCE OF CUTTING-EDGE TECHNOLOGIES



ADVANCED AERODYNAMICS



MATERIALS SCIENCE



INNOVATIVE PROPULSION SYSTEMS



ARTIFICIAL INTELLIGENCE AND MACHINE  
LEARNING



HIGHLY SOPHISTICATED AVIATION SYSTEMS



OPERATION IN COMPLEX ENVIRONMENTS



UNPRECEDENTED EFFICIENCY AND SAFETY



ACCELERATED EVOLUTION OF THE FIELD



# TECHNICAL CHARACTERISTICS AND CAPABILITIES

## "TECHNOLOGICAL REVOLUTION IN MOTION"



- ✓ ADVANCED PROPULSION SYSTEMS
- ✓ MATERIALS AND STRUCTURAL DESIGN
- ✓ AUTONOMOUS NAVIGATION AND CONTROL SYSTEMS
- ✓ POWER SYSTEMS AND THERMAL MANAGEMENT
- ✓ ADVANCED CAPABILITIES AND FUTURE APPLICATIONS



- ✓ AIRSPACE REGULATION
- ✓ CYBER SECURITY
- ✓ PRIVACY
- ✓ PUBLIC ACCEPTANCE

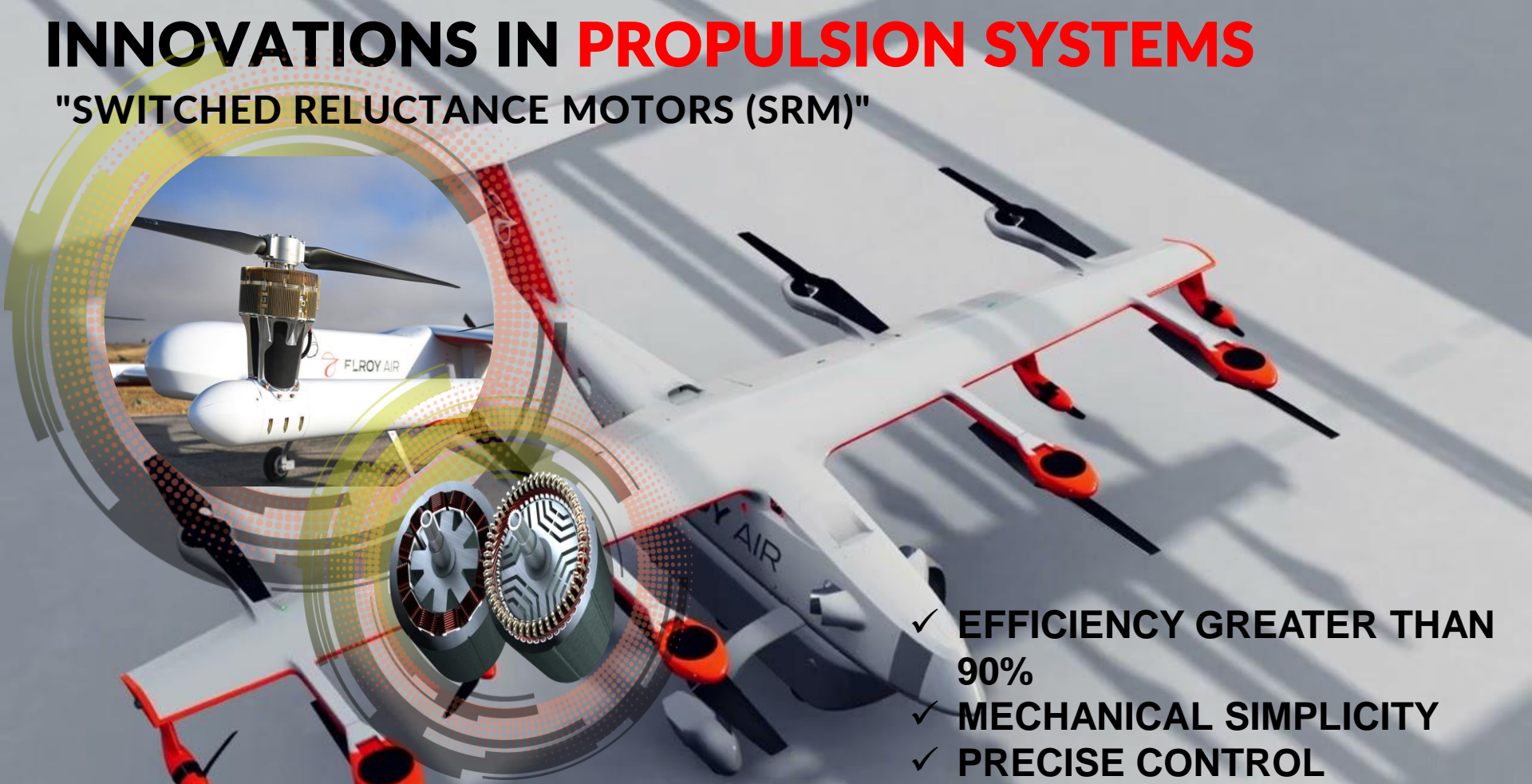


- ✓ CITY TRANSFORMATION
- ✓ CHANGES IN THE ECONOMY
- ✓ REDEFINING THE MOVEMENT OF GOODS AND PEOPLE



# INNOVATIONS IN PROPULSION SYSTEMS

"SWITCHED RELUCTANCE MOTORS (SRM)"

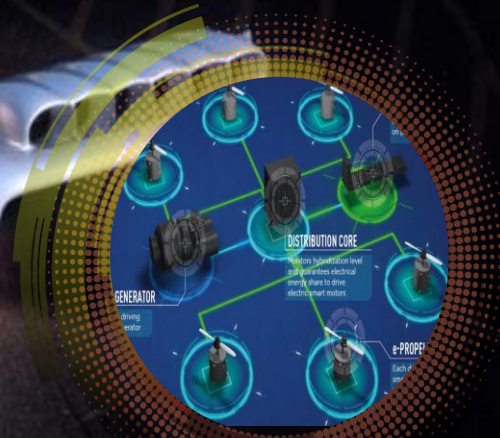
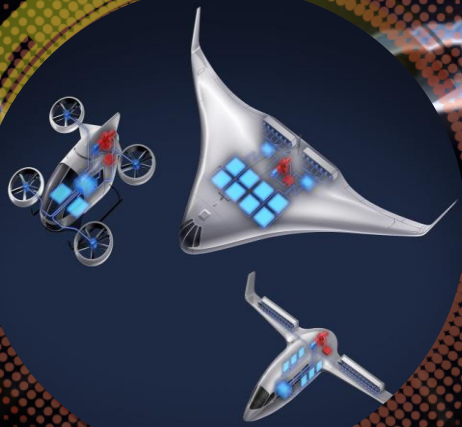


- ✓ EFFICIENCY GREATER THAN 90%
- ✓ MECHANICAL SIMPLICITY
- ✓ PRECISE CONTROL



# INNOVATIONS IN PROPULSION SYSTEMS

## "ELECTRIC DISTRIBUTED PROPULSION SYSTEMS (EPS)"



- ✓ MULTIPLE DISTRIBUTED SMALL MOTORS
- ✓ INCREASED REDUNDANCY AND SECURITY
- ✓ PRECISE AND AGILE FLIGHT CONTROL
- ✓ IMPROVED AERODYNAMIC EFFICIENCY



# HYBRID SYSTEMS AND **ADVANCED PROPULSION**

"HYBRID-ELECTRIC PROPULSION"



- ✓ COMBINES ELECTRIC EFFICIENCY AND COMBUSTION RANGE
- ✓ INCREASED REACH AND LOAD CAPACITY
- ✓ OPERATIONAL FLEXIBILITY



# HYBRID SYSTEMS AND ADVANCED PROPULSION

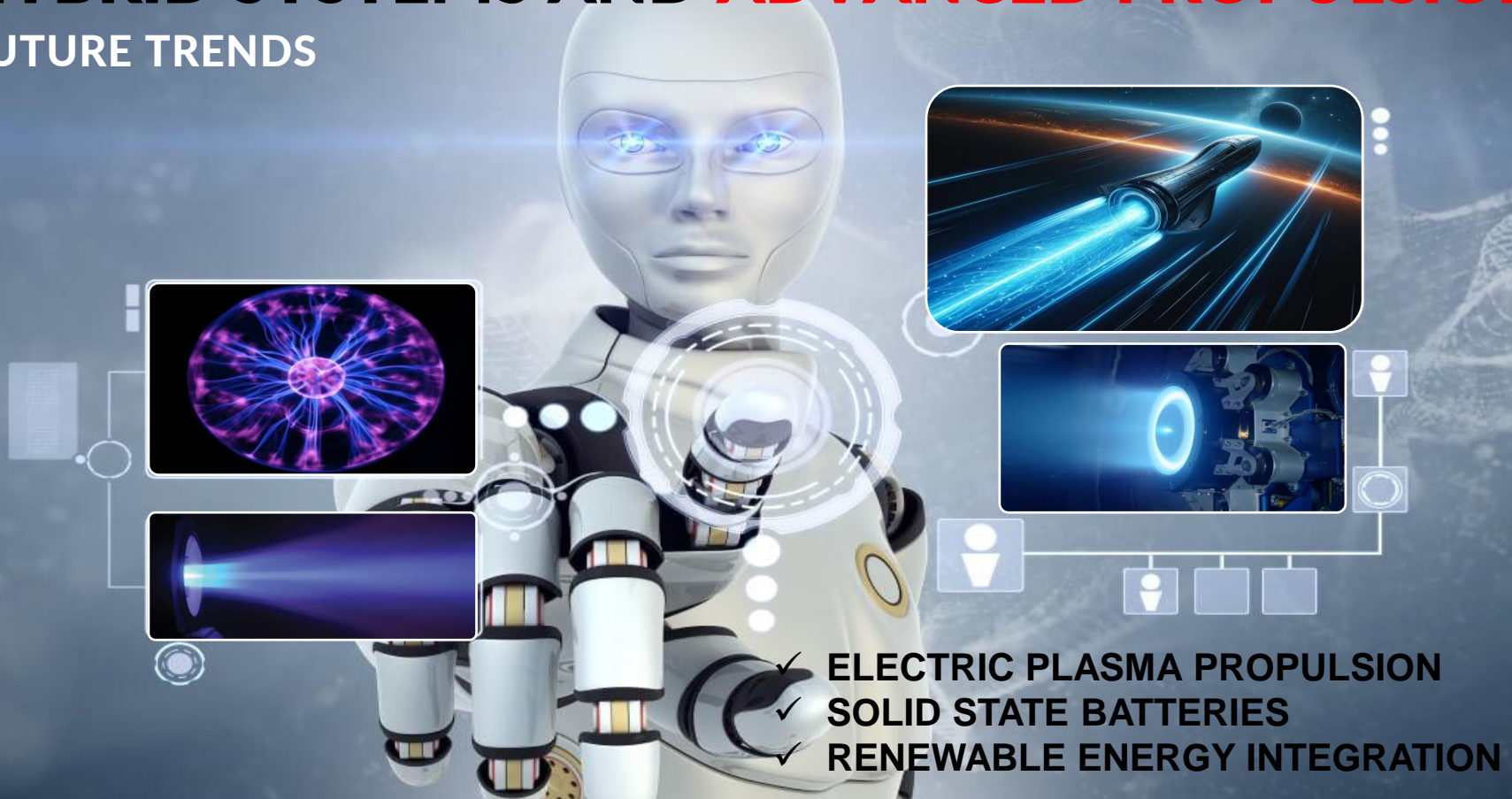
“SISTEMAS DE PROPULSIÓN VECTORIAL”

- ✓ DIRECTIONAL THRUST CONTROL
- ✓ SMOOTH TRANSITIONS BETWEEN VERTICAL AND HORIZONTAL FLIGHT
- ✓ IDEAL FOR COMPLEX URBAN ENVIRONMENTS



# HYBRID SYSTEMS AND **ADVANCED PROPULSION**

## FUTURE TRENDS



- ✓ ELECTRIC PLASMA PROPULSION
- ✓ SOLID STATE BATTERIES
- ✓ RENEWABLE ENERGY INTEGRATION



# STATE-OF-THE-ART **COMPOSITE MATERIALS**



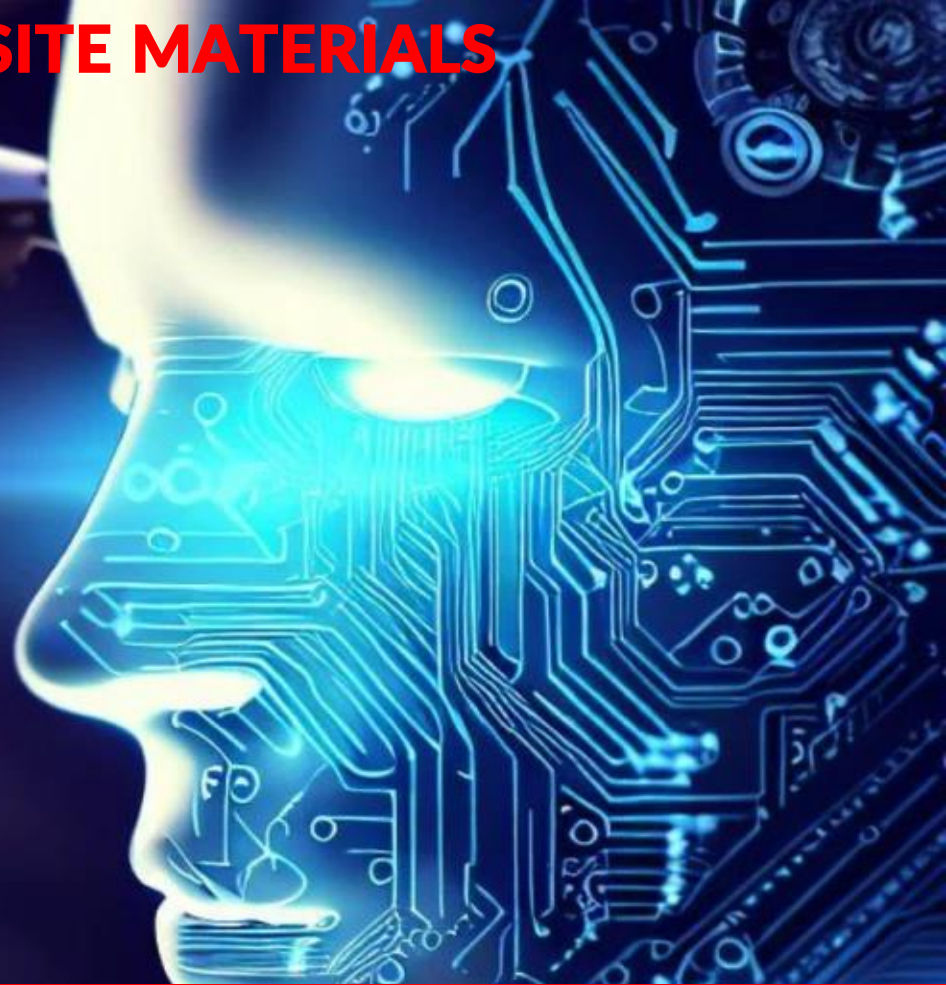
ULTRA HIGH MODULUS CARBON FIBER



THERMOPLASTIC COMPOSITES



NANOMATERIALS



# INNOVATIONS IN **STRUCTURAL DESIGN**



**ACOUSTIC METAMATERIALS**

**MORPHOLOGICAL STRUCTURES**

**SELF-HEALING SYSTEMS**

**KEY BENEFITS**



# ADVANCED CONTROL AND NAVIGATION TECHNOLOGIES

**QUANTUM FLIGHT  
CONTROL SYSTEMS**

**ARTIFICIAL INTELLIGENCE  
AND DEEP LEARNING**

**ADVANCED SENSOR FUSION  
SYSTEMS**



# INNOVATIONS IN **AUTONOMOUS OPERATIONS AND SAFETY**

**COLLABORATIVE SWARM CONTROL**



**TURBULENCE PREDICTION AND MITIGATION SYSTEMS**

**FUTURE IMPACT**



# INNOVATIONS IN ENERGY STORAGE AND SUPPLY

WIRELESS CHARGING SYSTEMS



HYDROGEN FUEL CELLS



SOLID STATE BATTERIES



# THERMAL MANAGEMENT AND EMERGING TECHNOLOGIES

IN-FLIGHT ENERGY HARVESTING



ADVANCED THERMAL MANAGEMENT



# **DRONES**VIP

**QUESTION TIME!**

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