HyperSonic Propulsion Systems

revolutionizing transport
without costing the earth

HYPERSONIC PROPULSION SYSTEMS
AND DRAG REDUCTION

Long before the climate crisis took hold, scientists dreamed of a day when high-speed transportation systems based on renewable energy would become the rule – rather than the exception – for air, land and water travel. Thanks to HyperSonic Propulsion Systems, that day has come.

HyperSonic Propulsion technology is based on a clean-burning, hydrogen-based explosion-implosion sequence that literally blasts the air out of the way of a moving vehicle.

Because the only byproduct of this technology is water vapor (the oxygen is burned with the hydrogen), **HyperSonic Propulsion** is a mode of transport that allows for rapid speeds at zero cost to the atmosphere.

Best of all, **HyperSonic Propulsion** can be applied to existing fuel-based transportation infrastructures. The installation of oxyhydrogen (2H2+O2) drag-reducing devices in the front of traditional air, land and water vehicles can account for a possible 20% increase in speed with minimal added energy costs – and a substantially reduced carbon footprint.

We are currently seeking investors, green technology specialists and transportation authorities for partnership. Together, we can revolutionize transport, reduce fuel costs and reverse the effects of global warming.

HyperSonic Propulsion technology

HyperSonic Propulsion technology is based on the explosion of a two-to-one mixture of hydrogen and oxygen immediately followed by a condensation implosion. The systemic applications of this implosion-based technology include drag-reduction, propulsion and lift generation for air, land and water vehicles.

FEATURES OF HYPERSONIC PROPULSION

- Fuelled by electricity and water with electrolysis producing oxygen-hydrogen mixture (oxyhydrogen)
- Minimal to no storage of oxyhydrogen required
- Combustion of oxyhydrogen (stoichiometric mixture) produces high temperature water vapor
- Explosion of oxyhydrogen can be precisely controlled and directed
- Explosion of oxyhydrogen is extremely rapid with flame propagation speeds of about mach 7.5
- Implosion of water vapor exposed to a highly conductive heat sink is very rapid and forceful
- Implosion of water vapor can also be controlled by injection of water droplets at ambient temperature and at a lesser rate with injection of air
- Implosion rate can be controlled by the surface area, conductivity and temperature of a heat sink
- Explosion and implosion can operate on a continuous basis when spatially separated.

NOTE: The patent application for **HyperSonic Propulsion** technology has passed the Patent Cooperation Treaty international search with no conflicting prior art found. Now is the time for investors to get in on the ground floor of this unique technology.

Transportation Initiatives

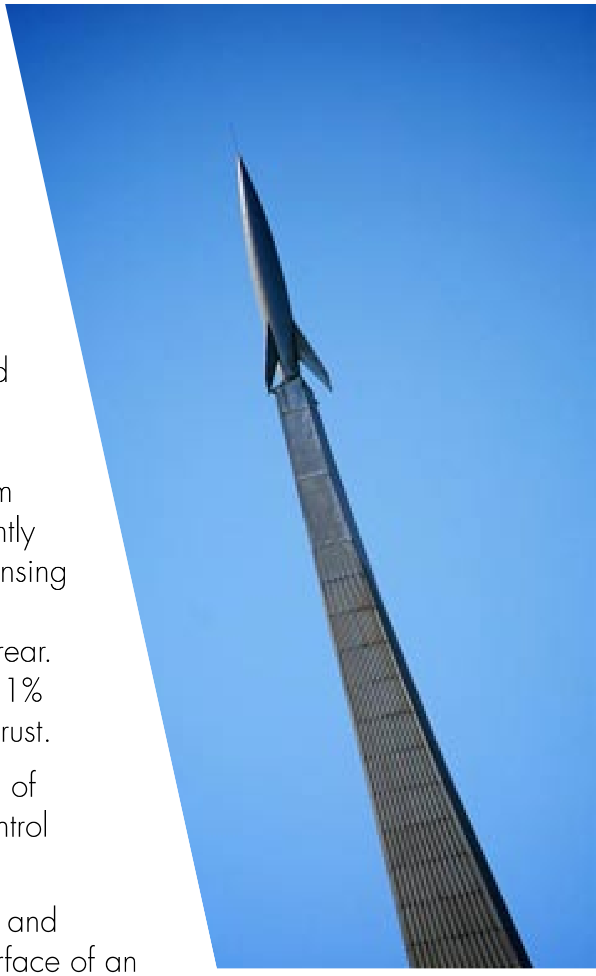
The application of **HyperSonic Propulsion** technology to clean transportation initiatives for air, land, water, and even space vehicles during atmospheric transit, is imminent – and the rewards will be bountiful.

"These airplanes we have today are no more than a perfection of a child's toy made of paper. In my opinion, we should search for a completely different flying machine, based on other flying principles. I imagine a future aircraft, which will take off vertically, fly as usual, and land vertically. This flying machine should have no moving parts."

– Henri Coanda

A new potential for flight

What if we could significantly reduce drag by blasting the air out of the way of an aircraft? What if the explosion's gas could be rapidly cooled and condensed to a liquid, thereby forming an implosion? Burning hydrogen in oxygen is the obvious choice for a non-polluting explosive. Fortunately, steam condenses at easily obtainable temperatures.



THE PHYSICS

The explosion emanating from the probe moves forward with the aircraft, and the explosion leaves a trailing conical plume of hot, expanding steam. The nose of the aircraft penetrates this plume preferably as it nears maximum expansion, has cooled somewhat, and has a minimum density. The nose of the aircraft is cooled, preferably by a refrigerant evaporating inside the nose. Water mist is also sprayed around the nose. The gaseous molecules of steam striking the cold nose and sprayed mist are slowed and/or captured by condensed water, leaving a region of reduced density around the nose. If the steam molecules were not cooled they would bounce off and impart significantly more momentum, tending to impede the aircraft. The low-density condensing steam imparts a reduced pressure and drag on the front of the aircraft. The aircraft is then thrust forward by the higher ambient pressure on its rear. Consider that atmospheric pressure is 10 tonne per square metre, so a 1% reduction of frontal pressure on a square metre could give 100 kg of thrust.

There is also the potential to control the attitude of an aircraft by control of airflow using HyperSonic Propulsion technology rather than moving control surfaces.

Controlling airflow by the selective explosion of hydrogen and oxygen, and selective implosion of steam, a force field is created near and at the surface of an aircraft.

If the force field can be adjusted to give constant pressure and density around the entire body, potential loss-free flow will result and there can be no shockwaves anywhere in the flow field. The control for the prevention of aerodynamic heating is essentially identical to the control for the prevention of shockwave drag.

CYCLICAL FLIGHT

If the buoyancy of an airship can be varied and the airship can glide, then it can travel quietly without propellers or jet engines.

UNDERWATER GLIDERS

By changing the volume of the glider, making it denser or lighter than the surrounding water, the vehicle floats up and sinks down while wings provide lift to drive the vehicle forward. This is done by pumping one litre of mineral oil between two bladders, one inside the aluminum hull and the other outside. Batteries power buoyancy change, onboard computers and other electronics. Its range is 6,000 km and there are many already in operation.

CONCEPTS OF FUEL-FREE FLIGHT

Fuel-free flight is flight for which the energy required is obtained from the atmosphere, the sun and gravity. Imagine if you could sit on a molecule of water in the air. A water molecule is lighter than an air molecule, so it floats upwards. But it gets colder. Eventually it sticks to other water molecules and gets heavier than air, so it sinks downwards as mist or rain. Sunlight provides energy for evaporation and the cycle starts again.

This is the process that powers the weather. It is a huge source of renewable energy that can be used to power cyclical gliders, or "cycliders"!

POTENTIAL FOR FUEL-FREE FLIGHT

Now we turn the water molecule into a cyclider. We can improve the buoyancy by using a gas that is even lighter than steam. Ammonia gas can be liquefied at the temperature and pressure of 10,000m altitude. (Ammonia's Heat of Vaporization is 1368 kJ/kg at -33.4C and 1Atm.). The ammonia boils spontaneously at low altitude and the ammonia gas inflates the cyclider. The cyclider glides up to above 10,000 m and then the ammonia is cooled and spontaneously condensed. The cyclider then loses buoyancy and glides downwards to low altitude where the cycle is repeated. No fuel is required to power this cyclider!

FUEL-FREE FLIGHT

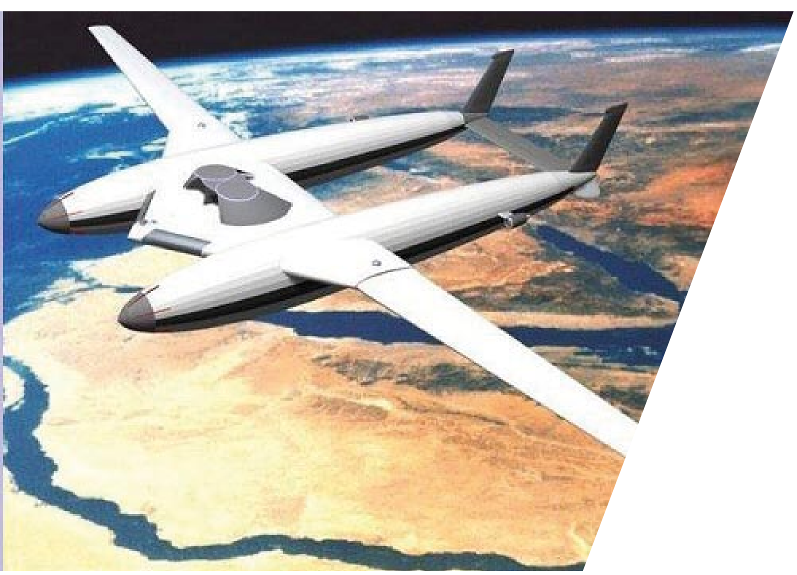
Water boils at lower temperatures if the pressure is reduced. That property of water is used in Robert Hunt's proposed cyclider. (see photo @ www.fuellessflight.com). He is currently testing 30m-long composite material tubes that can hold a vacuum. An air turbine on the top of the cyclider (grey) converts some of the airflow energy into electricity or pumps air into and out of the craft to change buoyancy. This is done at the expense of speed, of course. Predicted maximum speed is 100 km/hr.

POTENTIAL OF FUEL-FREE FLIGHT WITH HYPERSONIC PROPULSION TECHNOLOGY

At **HyperSonic Propulsion Systems**, we have learned the following:

- A lighter-than-air refrigerant such as ammonia can power fuel-free flight.
- Evaporation of a refrigerant is necessary to generate implosion in a **HyperSonic Propulsion** device.
- Power can be extracted from the airflow and used to generate electricity.
- Electricity can be used for production of hydrogen and oxygen by electrolysis.

Combining these concepts gives the potential for fuel-free flight at high speeds.



AIRFLOW CONTROL

If the "excraft" is enveloped in steam, then cooled and heated surfaces may suffice. No moving control surfaces would be required. Since it creates a low-pressure zone, a HyperSonic Propulsion device can be used on the upper surface of an aircraft to generate lift. Such an aircraft could potentially hover, including at ground level without disturbing the ground-surface.

Pressure can be increased on the underside and rear surfaces of the aircraft to increase lift and forward thrust. One way would be to externally burn $2H_2+O_2$ next to these surfaces. The attitude (yaw, pitch, and roll) of a HyperSonic aircraft could be controlled by the judicious placement of HyperSonic devices on its surface. In even more advanced applications of the HyperSonic Propulsion principle, it may be possible to cancel supersonic shockwaves out of the airflow by controlled expansion and contraction of the air.

As a rocket scientist, Paul Hill was awarded a NASA Exceptional Service Medal for his work on the design of spacecraft. In his spare time he researched unconventional flight systems. He concluded that an ideal unconventional flight system would require a force field to control airflow:

"… it will be shown that if the force field is adjusted to give constant pressure and density around the entire body, potential loss-free flow will result and there can be no shockwaves anywhere in the flow field."
(Hill, Paul R., Unconventional Flying Objects. 1995. p.182)

"…the control for the prevention of aero-dynamic heating is essentially identical to the control for the prevention of shockwave drag…" (Ibid, p. 212)

Understood Flying Objects

The following documented observations of unconventional flight systems indicate a distinct similarity to our technology.

Halos	Illuminated halo from an envelope of air tending to obscure vehicle. Sometimes conical. Colour related to speed.
Colour	Solidly lighted surfaces, usually on underside.
Heat	Mild sensation of warmth is sometimes observed.
Maneuvers	Hovering, high acceleration & deceleration, tilt to maneuver and turn.
Speed	Up to 15,000 km/hr observed.
Acceleration	Up to 100 G observed.
Sound	Whine close up but often silent. Seldom a roar or supersonic boom.
Propulsion	No visible means. No exhaust or fumes.
Water	Observed submerging in water.

Hydrogen Combustion

LH2 (Liquid Hydrogen) requires large tanks, pipes, and pumps. So LOX/LH2 (LOX, Liquid Oxygen) rockets are run very rich (O/F (Oxidizer/Fuel) mass ratio of 4 rather than stoichiometic 8). This is okay because hydrogen is so light that with extra hydrogen the energy release per unit mass of propellant drops very slowly from the stoichiometric ideal. Another reason for running rich is that off-stoichiometric mixtures burn cooler than stoichiometric mixtures, which makes engine cooling easier. Also, most rocket engines are made of metal or carbon, so hot oxidizer-rich exhaust is extremely corrosive. Fuel-rich exhaust is less so: http://en.wikipedia.org/wiki/Rocket_fuel.

However, a **HyperSonic Propulsion** device's performance suffers if the mixture is too rich because the implosion is reduced when the exhaust is contaminated by excess hydrogen. Therefore the mixture is a tool for influencing whether the explosion or the implosion is more efficient in the device.

Steam Condensation

At standard atmospheric pressure, steam has a temperature of around 100 degrees Celsius, and occupies about 1,600 times the volume of liquid water: hence the potential for implosion. The heat of condensation of water is about 2,260 kJ/kg. It is five times the energy needed for heating the water from 0°C to 100°C. Specific Heat indicates the energy transferred when a substance changes temperature. For a gas, there is specific heat at constant pressure cp and at constant volume cv. Specific heat capacity of steam is cp = 2.0267 kJ/(kg.K) at standard ambient temperature and pressure. These are not the conditions in a HyperSonic implosion. However, this heat per degree K is about one thousandth the heat of condensation, so it shows that the heat of condensation will dominate the cooling requirements. Satisfying cooling requirements efficiently *is* a key to success.

Community

The ever-growing community surrounding HyperSonic Propulsion Systems is one of the most dynamic in the world. We invite all interested individuals and organizations to join our research and development initiatives. HyperSonic Propulsion Systems also encourages the exchange of information through conferences, newsletters, news groups, and email blasts.

CEO AND FOUNDER

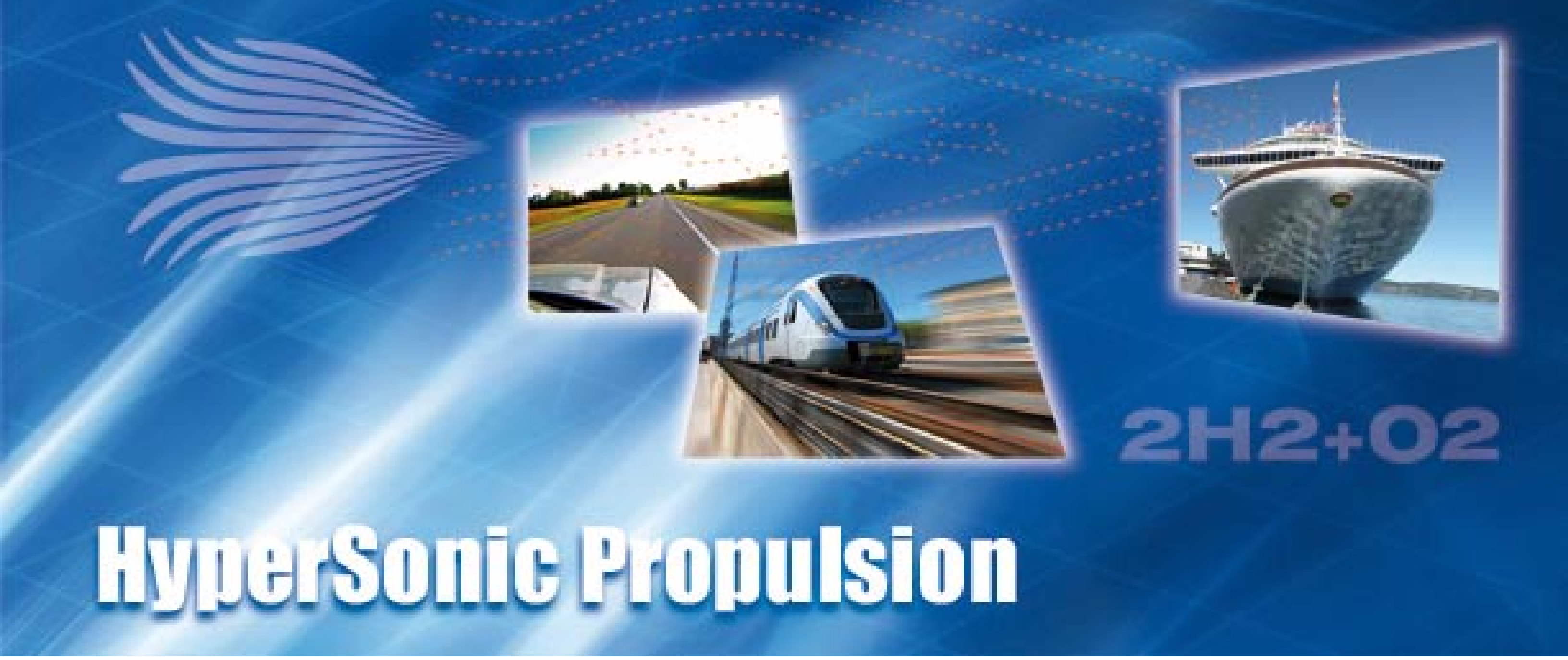
Mr. Sapoty Brook, **HyperSonic Propulsion System**'s CEO and founder, began his professional career as an engineer and inventor. His first degree was in physics from the University of Melbourne. He was then selected to train as an electrical engineer at Monash University by Australia's telecommunications provider. The experience with this organiszation prompted the writing of technical reports, electronics and software design, and project management.

Fascinated by energy conversion systems, Mr. Brook patented a variable displacement hydraulic pump and won the Australian Inventor's Award in 1980. Seeking more creative employment opportunities, he became a research scientist with an advanced robotics project at the University of Western Australia, where he co-invented a remote sensing system. He then went on to complete a Master of Science by research into neural information processing.

Since 1996, Mr. Brook has pursued an interest in flight systems. This originated in his childhood where his family had substantial involvement in aviation in Australia. In 2000, while considering the serious limitations imposed by air resistance on airships, Mr. Brook discovered the basic principle of excuser technology. In 2005 he submitted a provisional patent application and founded HyperSonic Propulsion Systems. -

INVENTORS AND INNOVATORS

HyperSonic Propulsion Systems developers will have direct involvement in bringing this incredible technology to the international forefront. This is an exciting new field open to anyone with the interest, skills, and persistence to create and implement new technologies.



INVESTORS

While we at **HyperSonic Propulsion Systems** have come a long way in developing technologies for revolutionizing transport, reducing fuel costs and reversing the effects of global warming, we still have a long way to go. We are currently seeking investors to help us prove that **HyperSonic Propulsion** technology is both feasible and viable with regard to the future of transportation. If you are excited by the potential of our implosion-based technology, you should consider owning a stake in our ongoing research and development.

These include:

HyperSonic mechanics oxy-hydrogen propulsion

Hover and lift systems

Rapid sea, land and air transportation systems

Atmosphere/Space transfer transportation and intra-planetary transportation

Energy efficiency and fuel-free flight

For more information
regarding investment in
HyperSonic Propulsion Systems,
please contact:

Roger Green
BreakThru Technologies
New York City
info@BreakThru-Technologies.com
cell 1-848 702 3779
office 1-212 421 2768