HAPS Alliance
HIGH ALTITUDE PLATFORM STATION

THE HAPS ALLIANCE

Unlocking the potential of the stratosphere

Q1 2021

STRATOSPHERE HASN'T RECEIVED MUCH COMMERCIAL ATTENTION UNTIL RECENTLY

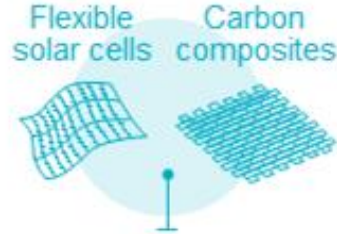Harsh conditions for long-duration flights:

- Pressure and thermal conditions of -65°C
- Wind speeds exceeding 40 km/hour
- Gravity waves and solar radiation at 20 km above the earth

THE LATEST TECH AND REGULATORY ADVANCEMENTS HAVE PAVED THE WAY FOR HAPS
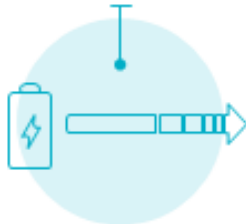

Artificial Intelligence & Machine Learning

Flexible solar cells   Carbon composites
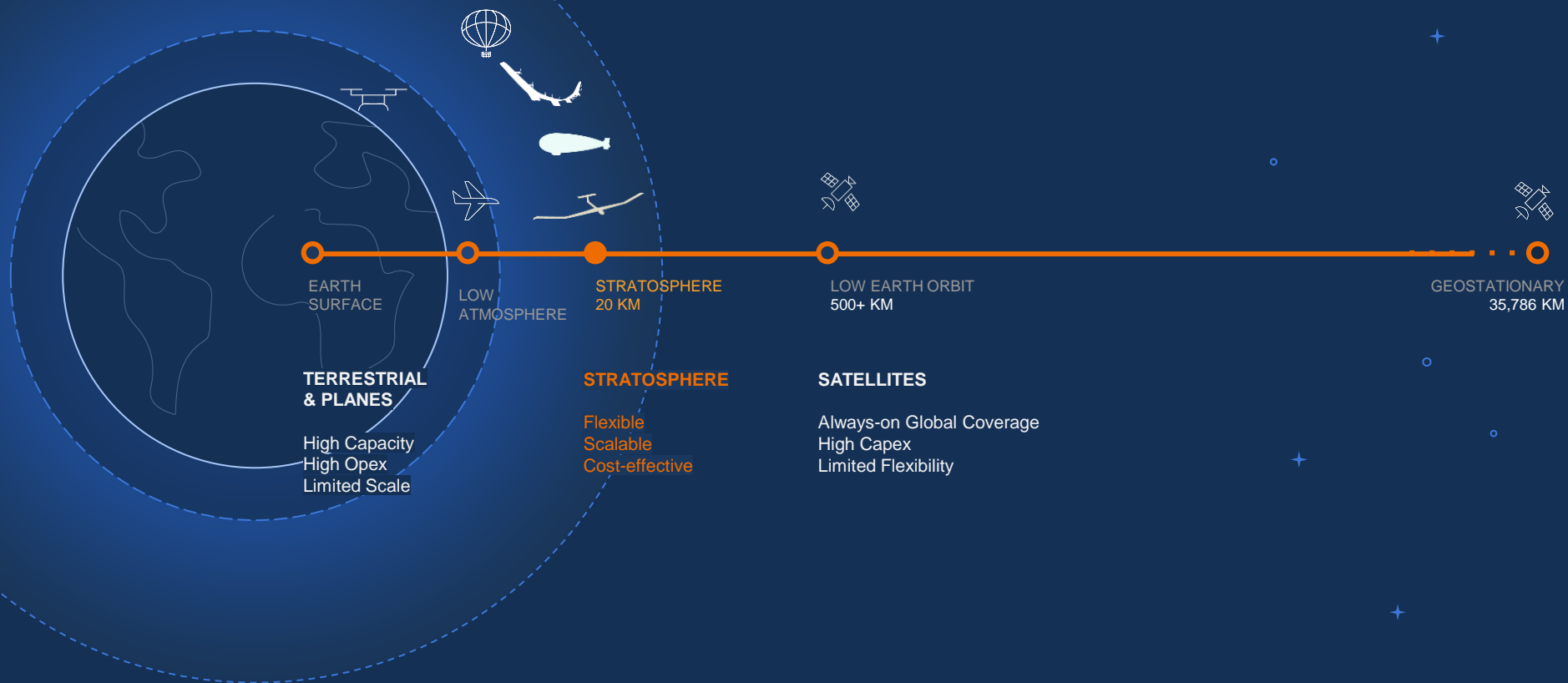
New Materials

Regulation Advancements

Batteries & Power Improvements

Instruments Miniaturisation

Public UAS Acceptance

EACH LAYER HAS ITS OWN VALUE PROPOSITION FOR CONNECTIVITY

EARTH
SURFACE

LOW
ATMOSPHERE

STRATOSPHERE
20 KM

LOW EARTH ORBIT
500+ KM

GEOSTATIONARY
35,786 KM

**TERRESTRIAL
& PLANES**

High Capacity
High Opex
Limited Scale

STRATOSPHERE

Flexible
Scalable
Cost-effective

SATELLITES

Always-on Global Coverage
High Capex
Limited Flexibility

STRATOSPHERE: ENABLING A WIDE RANGE OF APPLICATIONS

CONNECTIVITY   EARTH OBSERVATION   NATURAL RESOURCE MGMT   DISASTER MGMT   WEATHER   SECURITY & DEFENSE   GOVERNMENT

HAPS can close the digital divide and connect under connected and unconnected areas

HAPS can help us detect a fire earlier and extinguish it faster

In an emergency situation, HAPS can be retasked on short notice to assist faster those in need

A CONSORTIUM OF LEADING COMPANIES CATALYZING THE HAPS ECOSYSTEM

ACCELERATE COMMERCIAL ADOPTION

Identify commercial use cases and business models, and build industry-wide standards & interoperability guidelines.

SAFETY & REGULATORY ADVOCACY

Build the HAPS ecosystem in a safe and non-discriminatory way, in collaboration with both telecom and aviation regulators.

HAPS Alliance
HIGH ALTITUDE PLATFORM STATION

A COALITION OF THE LEADING VOICES IN THE HAPS INDUSTRY

CROSS-INDUSTRY COLLABORATION

Liaise with industry organizations by delivering focused, and pertinent guidance relating to HAPS technology and market opportunities.

THOUGHT LEADERSHIP & EDUCATION

Coalesce the voices of HAPS industry leaders into a compelling message for partners, regulators, and the public.

BRINGING TOGETHER TELECOM, AVIATION AND TECHNOLOGY INDUSTRIES

AA Access Partnership Limited
AeroVironment Inc.
Airbus Defense and Space GmbH
Airservices Australia
Altran/Capgemini
Amprius Technologies, Inc.
Armasuisse Science & Technology
AT&T
Auriga Aerospace Ltd.
AVEALTO Ltd.
B2Space
Bharti Airtel
Deutsche Telekom AG
Dhruva Space Private Limited
Digital Council Africa
Ericsson AB
ESEN, University of Manouba, Tunisia
Filtronic
Gilat Satellite Networks
Hacettepe University
HAPSMobile Inc.
Intelsat US LLC
KDDI Corporation

KAUST
Kratos
Kraus Hamdani Aerospace, Inc.
Liverpool Hope University
Loon
Luxon Consulting Group, LLC
MicroLink Devices
National Institute of Information and Communications Technology
NEAR SPACE CORPORATION / TILLAMOOK UAS TEST RANGE
Nokia of America Corporation
Northern Territory Government of Australia
Radisys
Raven Aerostar
Sceye Inc.
SoftBank Corp.
STRATOSYST s.r.o.
TAO Trans Atmospheric Operations GmbH
Telecommunications Management Group, Inc.
Telefonica Investigacion Y Desarrollo S.A.U.
UAVOS Inc.
University of Applied Sciences and Arts Northwestern Switzerland
University of York

COMPLEMENTING THE WORK OF OTHER LEADING ORGANIZATIONS

TELECOM

AEROSPACE

3GPP
Technical requirements & recommendations

ITU & National Regulators
Spectrum studies & recommendations

GSMA
Business case & market studies

Aerospace Industries Association
Regulatory policy alignment

ICAO & National Regulators
ATC & Safety Policies

HAPS ALLIANCE WORKING GROUPS

TELECOM

To advance the global HAPS ecosystem for telecommunications use cases through education, research, regulatory advocacy, and technical standards

The primary goals of the TWG:
- Explore, develop, and advocate for common regulatory positions
- Contribute to relevant technical standards related to HAPS
- Publish impactful papers on telecommunications use cases (white papers, academic papers)
- Position Alliance as the premier forum for policy and technical discussions related to HAPS
- Encourage innovation that improves HAPS-based telecommunication solutions

AVIATION

Advance aviation regulations, concept of operations, technologies, and standards to foster the HAPS industry as a whole. Communicate on the HAPS ecosystem vision and educate aviation players and regulators on HAPS specific needs.

The work will focus around 4 general categories:
- Development of a new traffic management paradigm for the stratosphere
- Develop risk-based safety frameworks adapted to HAPS
- Evolve the regulatory framework for approval (certification, performance based) of HAPS vehicle – design, and equipage.
- Develop and promote concepts for scalable operations (automation certification, human-automation teaming)

MARCOMMS

The primary goal of MarComms WG is to support and promote the business goals and advancement of the HAPS Alliance in regulatory alignment, cross-industry partnerships and HAPS industry awareness.

The WG will work to:
- Educate and Inspire regulators, media, analysts and general public on the value of HAPS and hybrid networks
- Build credibility and establish authority in HAPS operations
- Create an ecosystem through documenting and sharing successful commercial opportunities, cross-industry partnerships and regulatory alignment

For more information about the working groups, visit https://hapsalliance.org/wg-information/

HAPS: A UNIQUE SOLUTION TO PROVIDE CONNECTIVITY

NEARLY HALF OF WORLD'S POPULATION LACKS INTERNET ACCESS

3.8 BILLION PEOPLE or about **half of humanity,** don't have access to the internet

> 50 percent of the world's landmass is covered by terrestrial internet infrastructure

HAPS: A UNIQUE SOLUTION TO UNLOCK NEW CONNECTIONS

New Connections

Bringing people online, especially in large areas with lower population density

Flexible

Complements terrestrial network

Movable fleet

Future Proof

Adaptive, resilient fleet

Easily upgradable

Natural disasters can cause massive damage to telecommunications infrastructure.

Recovery takes weeks while users need immediate service.

HAPS: CONNECTIVITY SOLUTION POST-DISASTER

Weather Resilient

HAPS flying far above ground weather at 20km.

Ground equipment can be stored, moved, mounted.

Power Resilient

Each HAPS is independently solar-powered, with battery storage, and is not reliant on the local power grid.
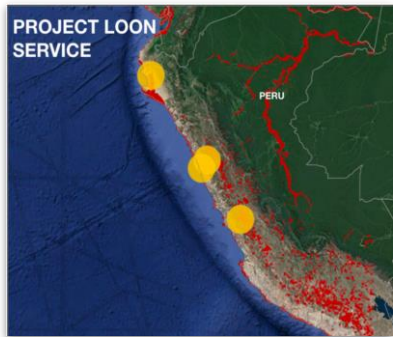
Easy deployment

HAPS solutions require minimal deployment effort and ground logistics.
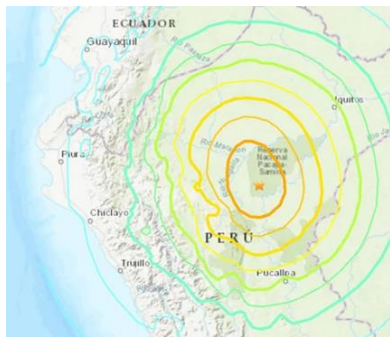
Fast activation

When prepositioned in a region before disaster strikes, HAPS can provide service quickly in the moments that matter most.

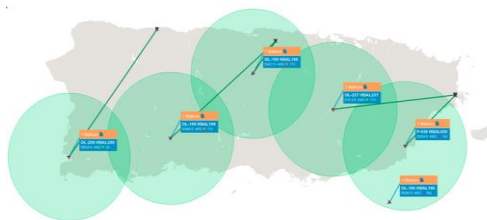# HAPS POST-DISASTER SOLUTION ALREADY SUCCESSFULLY DEPLOYED

2017: Peru

Reconnected 100,000+ Telefonica users post El-Nino floods
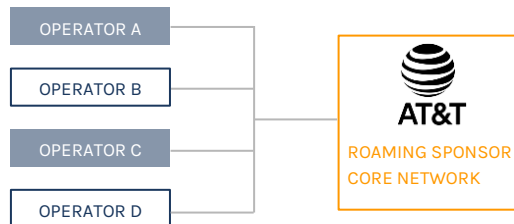
2019: Peru

Reconnected 20,000+ users in Amazon within 48 hrs of earthquake

2017: Puerto Rico

Loon provided internet to 250,000+ Puerto Ricans after Hurricane Maria

2020

Enabling scaled service across all AT&T LTE International roaming partners

STRATOSPHERE EXPANSION WITH HYBRID NETWORKS

HAPS MOBILE

After approx. 3 years of development, HAPSMobile's Sunglider successfully reached the stratosphere on September 21, 2020.
This flight test marked the world's first successful delivery of LTE connectivity from a fixed-wing HAPS autonomous aircraft in the stratosphere.

Total flight time : 20 hours and 16 minutes
(5 hours and 38 minutes in the stratosphere)

Sunglider flying in the stratosphere
Photo : HAPSMobile

HAPS WILL OPEN UP INCREMENTAL CONNECTIVITY OPPORTUNITIES FOR MNOs

The stratosphere can drive significant growth in the $3.9T mobile technologies and services business by bringing millions of people living in unconnected areas online, reconnecting people after disasters, building out the next generation of 5G networks, and connecting the future of Internet of Things (IoT) devices.

RURAL

SUBURBAN

ECONOMICALLY VIABLE COVERAGE EXPANSION IN RURAL AREAS

HAPS can act as floating cell towers, providing network latency that's comparable to that of terrestrial cell towers but with up to 200x the geographic coverage from a single vehicle. At an altitude of just 20 km, HAPS can connect directly to users' existing mobile handsets using standard protocols.

COST EFFICIENT 5G DEPLOYMENT IN SUBURBAN AREAS

Densely populated areas challenge the capacities of satellite infrastructure; on the other hand, as population density decreases and hard-to-reach areas ground-based cell towers aren't cost-effective to deploy. HAPS can help telecom service providers expand coverage to meet the needs of these demanding markets with 5G service.

DISASTER PREPAREDNESS AND NETWORK RESILIENCE

In addition to expanding telecom coverage into rural and challenging terrains, HAPS operate above the weather and can be moved at will, enabling flexibility in the coverage area and emergency coverage in times of outages and disasters.

JOIN HAPS ALLIANCE
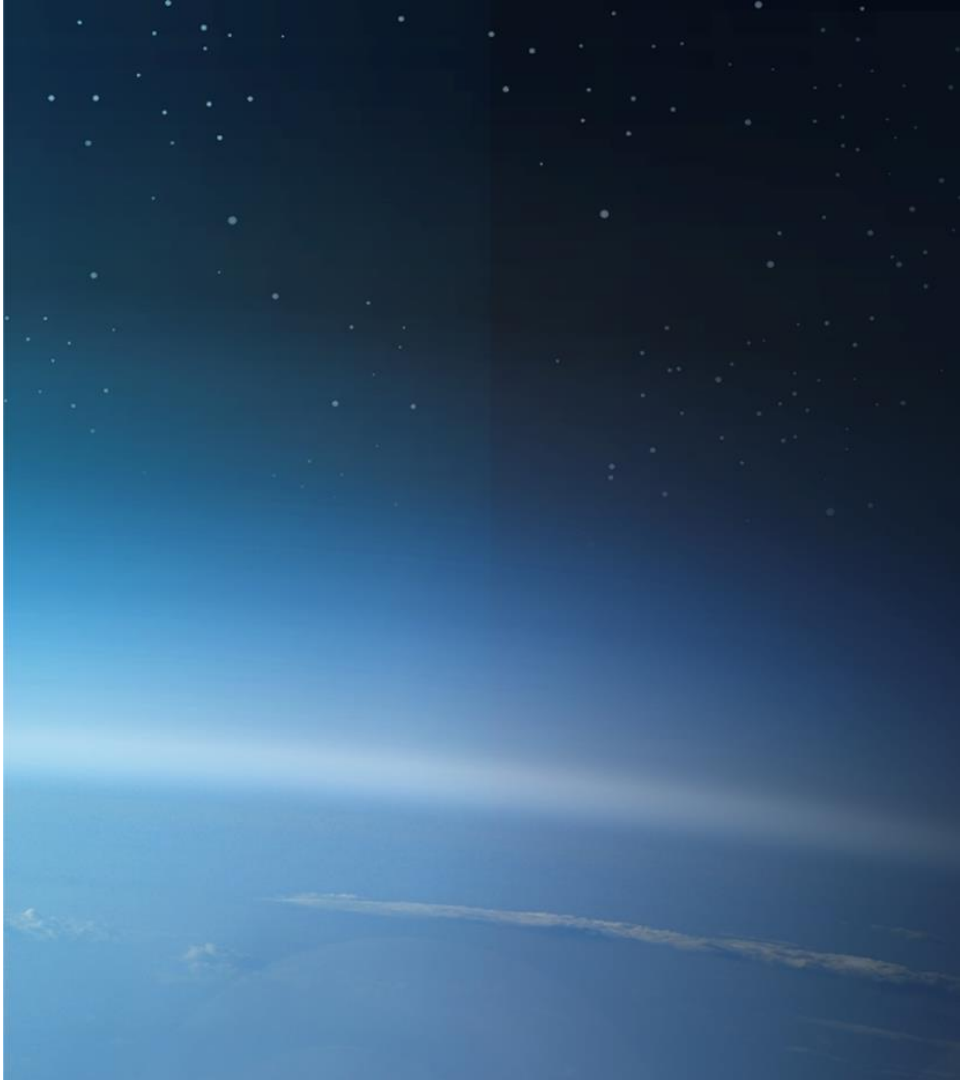
INFORMATION & EDUCATION
Collectively advocate the advantages of HAPS with relevant authorities

STANDARDIZATION & INTEROPERABILITY
Develop common product specifications and standards for HAPS interoperability

CREATE A HAPS ECOSYSTEM
Build a viable, cooperative and safe HAPS ecosystem

HAPS ALLIANCE MEMBERSHIP OFFERS

Principal Member
$25,000 / per year

- Eligible to be elected to Executive Board*
- Voting rights for Alliance documents (Executive Board members)
- May chair working groups and committees
- May propose new work items
- May participate and vote in working groups and committees
- Attend virtual and face-to-face events
- Access to documents in process
- Access to published documents

Additional $10,000 annual Director Fee if elected to the Executive Board

General Member
$10,000 /per year

- May participate and vote in working groups
- May attend committee meetings as an observer, where applicable
- Attend virtual and face-to-face events
- Access to documents in process
- Access to published documents

Government & Education Member
$0 / per year

Eligible applicants

Regulatory, Government, University

- Participate in Working Groups by invitation only
- May have one attendee at member meetings
- Access to published documents

Join Now/More Info

https://hapsalliance.org/membership/