Corporate Presentation

Thermo-mechanics | Systems & Control

activespace technologies

making space a global endeavour

If you want to work for AST

- Extra curricular activities
- International internships
- Languages

activespace technologies

If you want to work for AST

- Extra curricular activities
- International internships
- Languages

If you want to be an astronaut

- 2 degrees
- PhD

AST waives these requirements. So far.

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at AST we simulate the future...

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at AST we simulate the future...

... through applying modelling techniques based on Physical principles

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Contents

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Company Profile

Founded in 2004

Staff with more than 15 years of experience in mechanics and electronics

Over 10 years of research and development experience in the aerospace industry

Role

Offering high value services to R&D institutions, systems integrators, and SMEs

Fostering edge products development and technology transfer

Mission Statement

Providing mechanical and electronics engineering state of the art expertise

Offering turn-key subsystems, supplying the whole value-chain from requirements definition, CAD services, and modelling up to manufacturing and AIT

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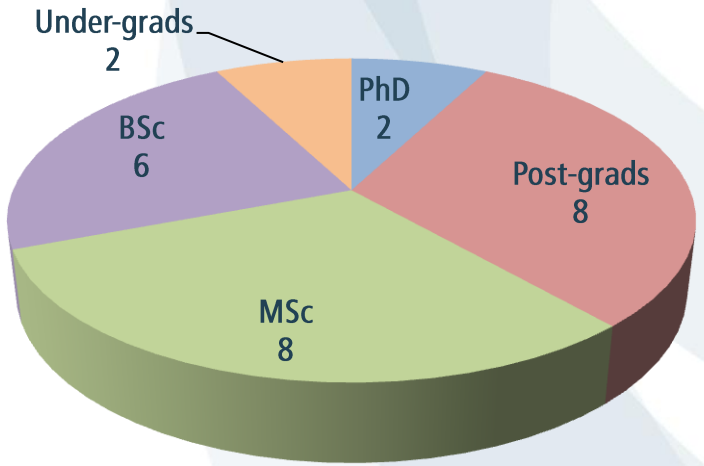
Company Profile

Specialised and Qualified Staff

Expertise in thermal, structures, electronics, optics, and software development

Adapted to international working environments



Awards

"Young Professionals Entrepreneurship Prize"
[Luigi Gerardo Napolitano Society] 2008

Ruban d'Honneur 2008:
"The Entrepreneur of the Year Award"

Jovem Empreendedor
Do Ano 2007 [ANJE]

PME Lider 2010
[IAPMEI]

Rede PME Inovação 2008
[Cotec]

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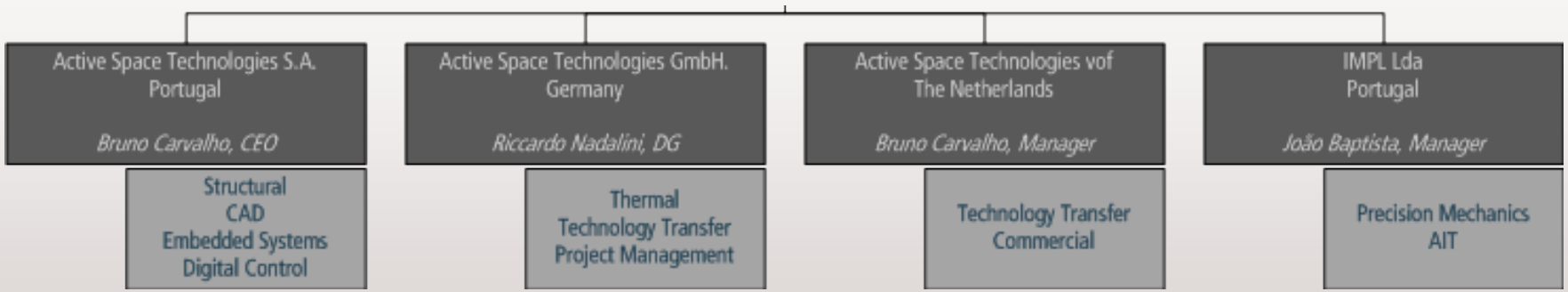
Company Profile

Offices	
Coimbra, Portugal	
Berlin, Germany	
Noordwijk, The Netherlands	

Legal Status
Private Capital
Small and Medium Enterprise (SME)
Shareholders of CEIIA

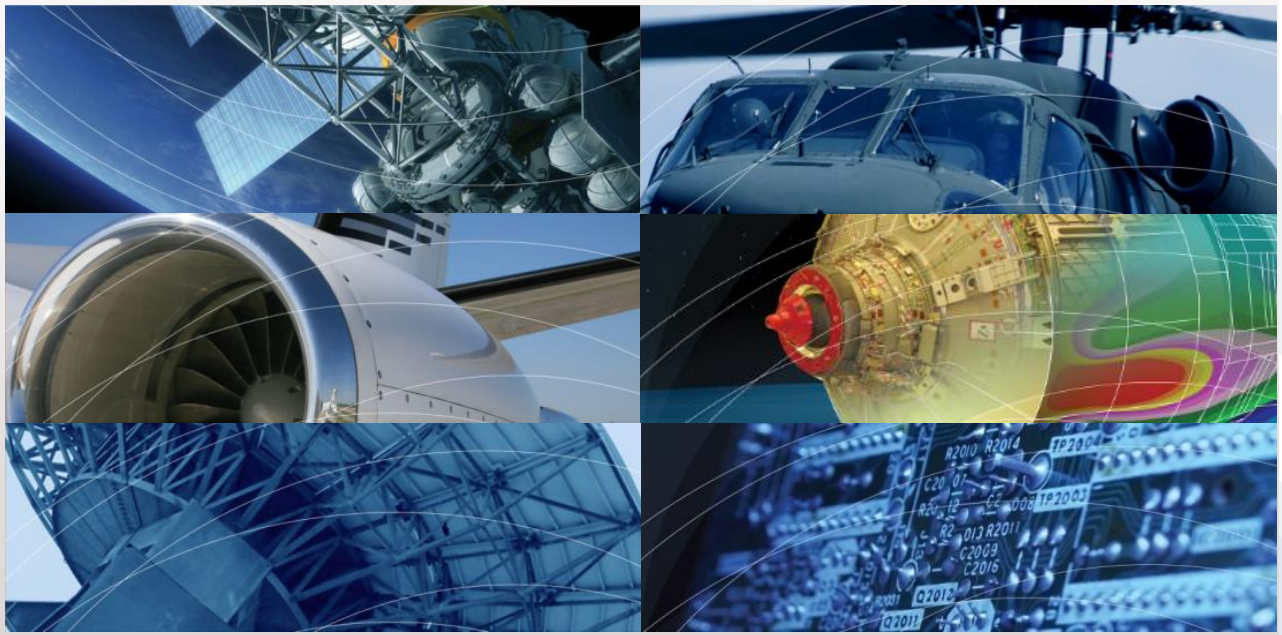
Organigram



Company Profile

Sectors of Activity

- Space
- Aeronautics
- Energy (eg, nuclear)
- Large Research Facilities
- Railway
- Defence
- Automotive
- Consumer Electronics



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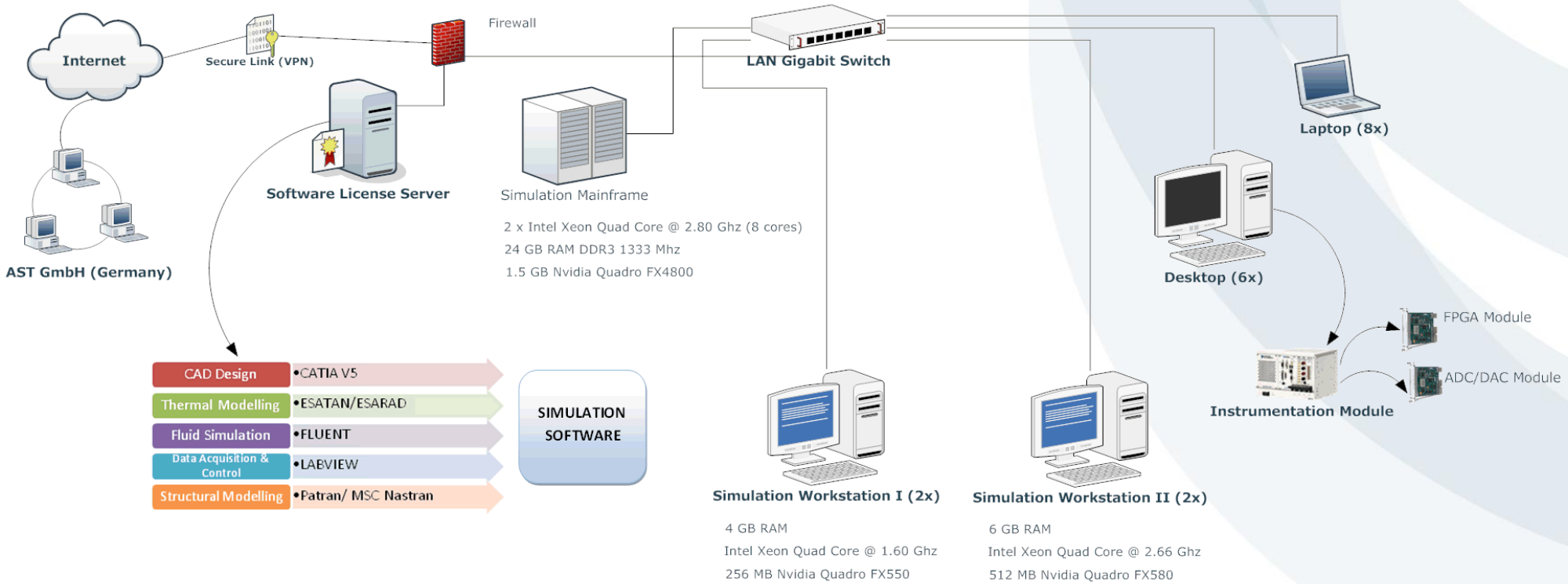
Company Profile

Simulation Capabilities



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Company Profile

Customers

UKAEA	OHB	Selex Galileo
EFDA	ESA	MEI
ITER	DLR	Callisto Space
ESO	Zeiss Optics	IPFN
F4E	Kayser Threde	Delta Utec
Hovemere	EFACEC	Pousada
IberEspacio	Thales Alenia Space	Bleuler Baumer
CIE	LusoSpace	ITER The Netherlands
Critical Software	Amorim	

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Services

Conceptual Design

- 3D CAD Design Catia, SolidWorks
- 2D Drawings, built-to-print

Engineering

- Thermal Analysis ESARAD / ESATAN, Fluent
- Structural Analysis Patran / Nastran
- CFD Fluent
- Digital Control
- Embedded Systems
- Materials R&D

Manufacturing

- CAM Design
- Precision CNC

Technology Transfer

Project Management

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$$\frac{\partial u}{\partial t} - k\left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2}\right) = 0$$

Heat equation – temperatures and heat fluxes

$$\rho\left(\frac{\partial \mathbf{v}}{\partial t} + \mathbf{v}\cdot\nabla\mathbf{v}\right) = -\nabla p + \nabla\cdot\mathbb{T} + \mathbf{f},$$

Navier-Stokes – fluid flow

$$\tfrac{1}{2}\rho v^2 + \rho g z + p = \text{constant}$$

Bernoulli's principle - aerodynamics

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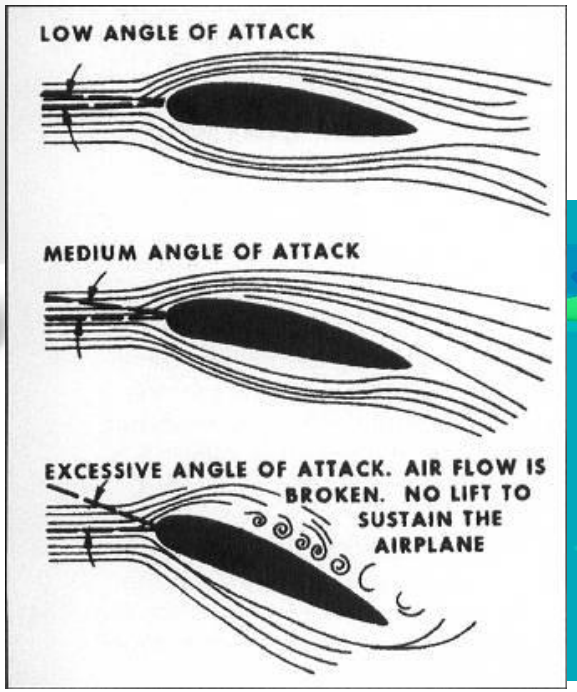

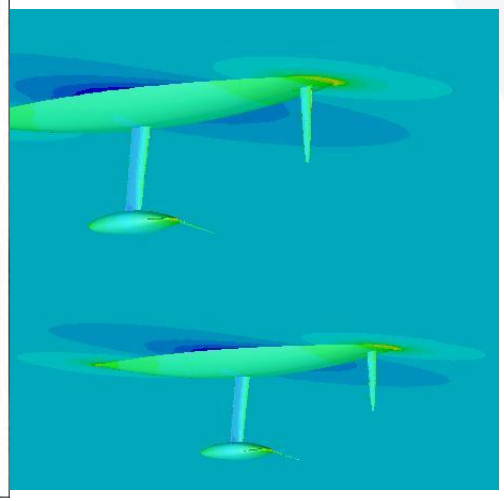

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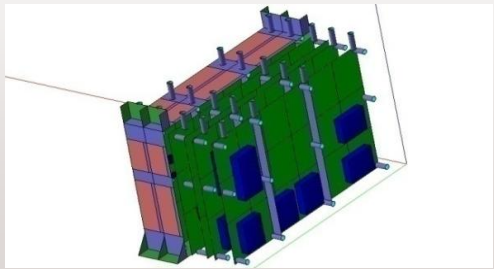
Services

Case Studies: thermal

BepiColombo (MMO): BELA

Thermal Design and Analysis

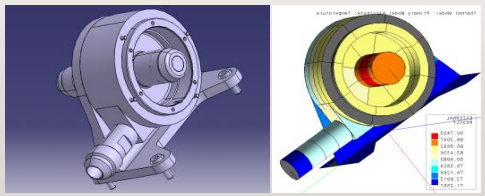
[DLR]



AlphaBus: Mechanically Pumped Fluid Loop

Thermal Analysis

[Bradford / Bleuler Baumer]

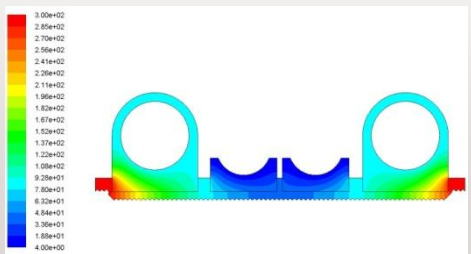


ITER: Diagnostic Neutral Beam

CAD Design

Thermo-mechanical Analysis

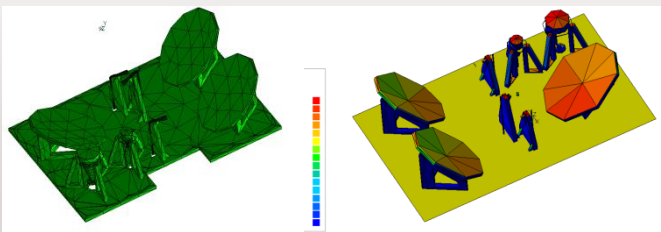
[EFDA / FZK]



AlphaSat: KuRBA

Thermal Architecture

[HPS]



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$$\sigma_f \sqrt{a} \approx C$$

Griffith's energy relation

$$\mathbf{F} = -k\mathbf{x}$$

Hook's Law

$$F = G\frac{m_1 m_2}{r^2},$$

Newton's law of universal gravitation

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$$\sigma_f \sqrt{a} \approx C$$

Griffith's energy relation

$$\mathbf{F} = -k\mathbf{x}$$

Hook's Law

$$F = G\frac{m_1 m_2}{r^2},$$

Newton's law of universal gravitation

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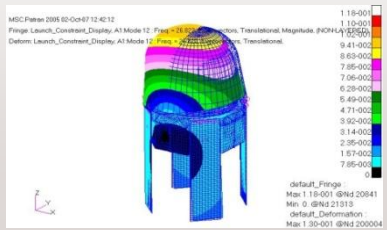
Services

Case Studies: structural

Mars Gravity Biosatellite

Structural Design and Analysis

[MIT / Georgia Tech]

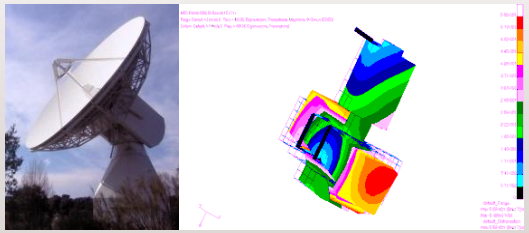


ESATRACK: Low Noise Amplifier

Structural Measurements

Structural Modelling

[ESA / Callisto]



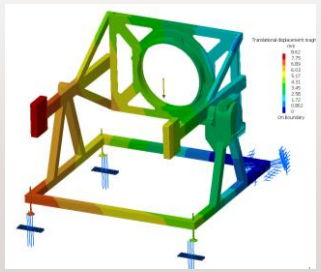
Sentinel 3: MGSE

Design

Thermal and Structural Analysis

AIT

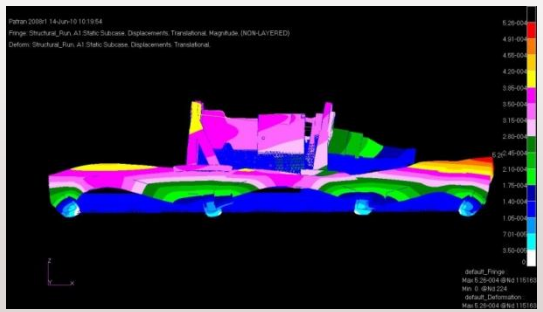
[Thales Alenia Space]



BepiColombo (MMO): MSASI

Structural Analysis

[JAXA / NEC]



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Services

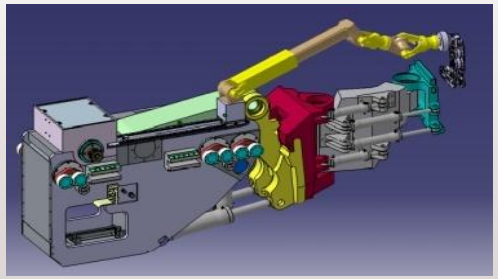
Case Studies: CAD

ITER: DTP2

CAD Design

Automation & Control

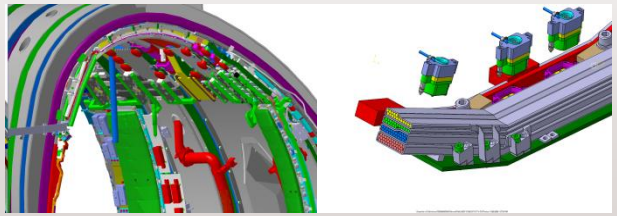
[EFDA]



JET: Engineering Team for Diagnostics Enhancement

CAD Design

[UKAEA]



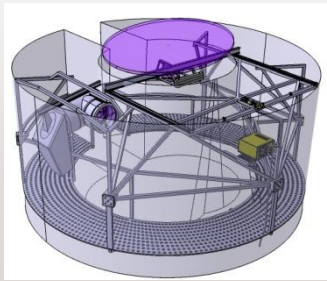
E-ELT: Adaptive Optical Calibration Unit

CAD Design

Optical Architecture

Structural Analysis

[ESO]



PAIC: Imperio

CAD Design

Manufacturing

Integration

[M.E.I. / Lockheed Martin]

$$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$$

Faraday's Law

$$I = \frac{V}{R}$$

Ohm's Law

$$\sum_{k=1}^{n} I_k = 0$$

Kirchhoff's current Law

$$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$$

Faraday's Law

$$I = \frac{V}{R}$$

Ohm's Law

$$\sum_{k=1}^{n} I_k = 0$$

Kirchhoff's current Law

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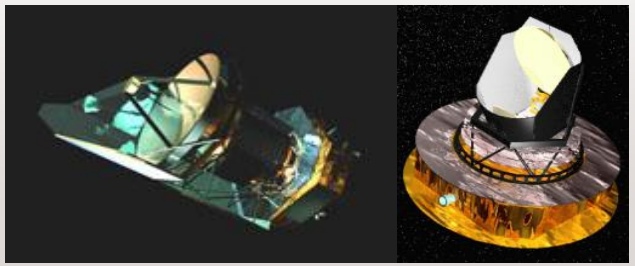
Services

Case Studies: Systems & Control

Herschell-Planck

On-board Software Verification

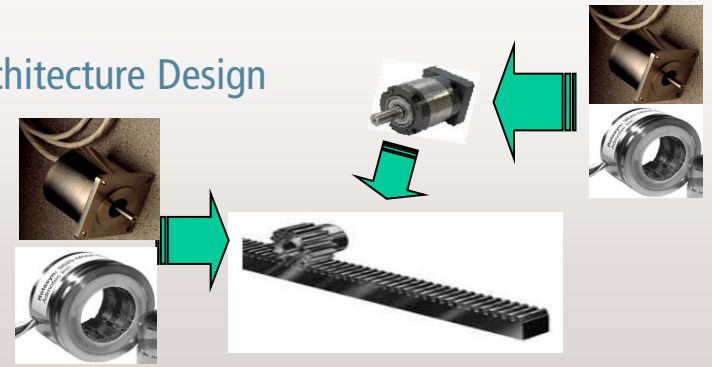
[ESA / Alcatel Alenia Space / Critical]



ITER: DTP2

Automation Architecture Design

[EFDA]



Phileas

Semi-automatic Vehicle Guidance Communication Protocols

[Hermes / Critical Software]

Flygear

Servo-actuator Architecture Design

[EC]

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Products

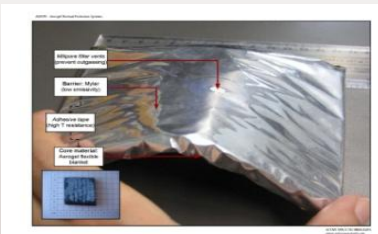
Energy Storage Units

Cryogenic Enthalpy Reservoir

1 h, 1 mW @ 6K, 200 g
1 h, 1 mW @ 20K, 200 g
1 h, 1 W @ 80K, 275 g

Aerogel Insulation Systems

High performance thermal insulation



0.080 g/cm^3
25 mW @ 9 mbar

SVAC

Small Vacuum Chamber

80 dm^3
0.1 – 1e-3 mbar
455 x 355 x 385 mm^3

Cork composites

Structural cork composites panels

Thickness: facesheets = 0.2 mm
Thickness core = 6 mm

CORE NL10: 332 kg/m^3, bending strength = 401 Mpa
CORE NL25: 365 kg/m^3, bending strength = 96 MPa

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Opportunities

Active Space Technologies	
Mechanical / chemical engineering	
Electrical / electronics / computer science engineering	

Internationalization	
ESA, Noordwijk (NL), CERN, Meyrin (CH)	
EFDA / ITER / JET, Culham (UK) / Cadarache (FR)	

Trainee Programmes	
AdI | ESA | CERN | ESO |	www.adi.pt
INOV Contacto	www.portugalglobal.pt
International Space University	www.isunet.edu
Von Karman Institute	www.vki.ac.be

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Contact us

For further information, please visit our website www.activespacetech.com

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