

New Zealand Space

APRSAF-18 Update (Dec 2011)

NZ Space

- ✦ No formal space agency/governing body
- ✦ No informal body like NSS existed -- so we formed KiwiSpace
- ✦ Active astronomy community
 - ✦ Joint Australia/NZ bid for the Square Kilometer Array
- ✦ Limited tertiary space-education options
- ✦ Essentially no space industry

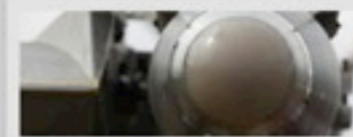


Image courtesy of Rocket Lab



Propulsion

Pushing the boundaries and redefining chemical propulsion



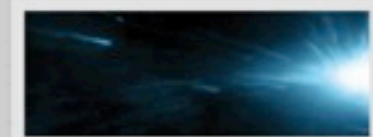
Space and Defense

- Rocket Deployed Surveillance Systems
- Sounding Rockets
- Recovery Systems
- Thermal Protection



Capabilities

- Engineering
- Launch Services
- Facilities



Propulsion

- Propulsion Testing
- Solid
- Liquid
- Hybrid
- High-Density Monopropellant



Electronic Systems

- Guidance and control
- Avionics
- Vision

Rocket Lab

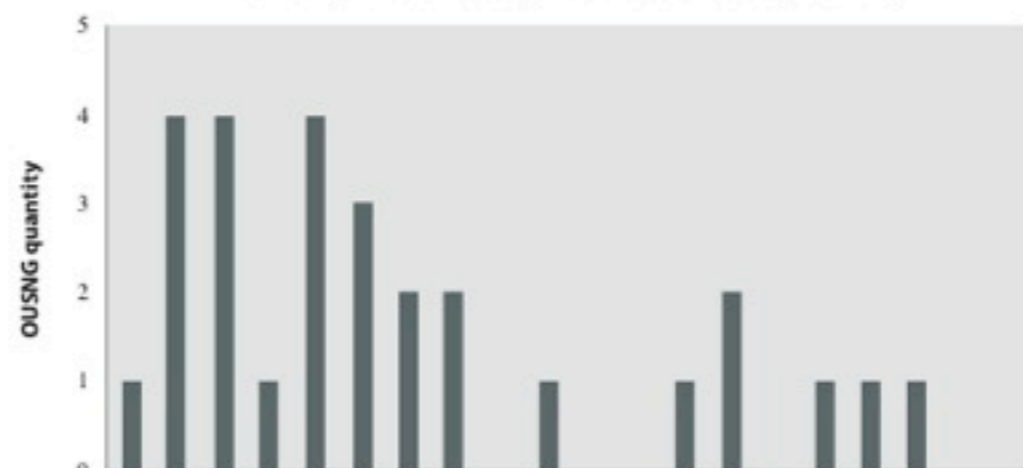


New 'State-of-the-Art' Thermal Sensitivity Achieved in Rakon's Ultra Stable Quartz Crystal Oscillator for Space Applications.*

In 2009 further research went into improving the thermal sensitivity of RAKON's space quartz crystal Ultra Stable Oscillator (USO). RAKON France (CEPE until 1998, C-MAC from 1998 to 2007, and RAKON since early 2007) has been working with CNES (the French Space Agency) to continuously improve performances of the Ultra-Stable OCXO (USO): OUS-NG^[1-2]. Its frequency sensitivity has a strong influence on final performance of the DORIS system (Doppler Orbitography and Radio-positioning Integrated by Satellite, CNES system) which uses RAKON's OCXO. The DORIS system is used in satellites such as 'Jason', 'Spot5', 'Cryosat', 'Pleiades', 'Topex-Poseidon' and 'Altika'. Significant effort has been put into additional improvements, mostly with regards to the thermal

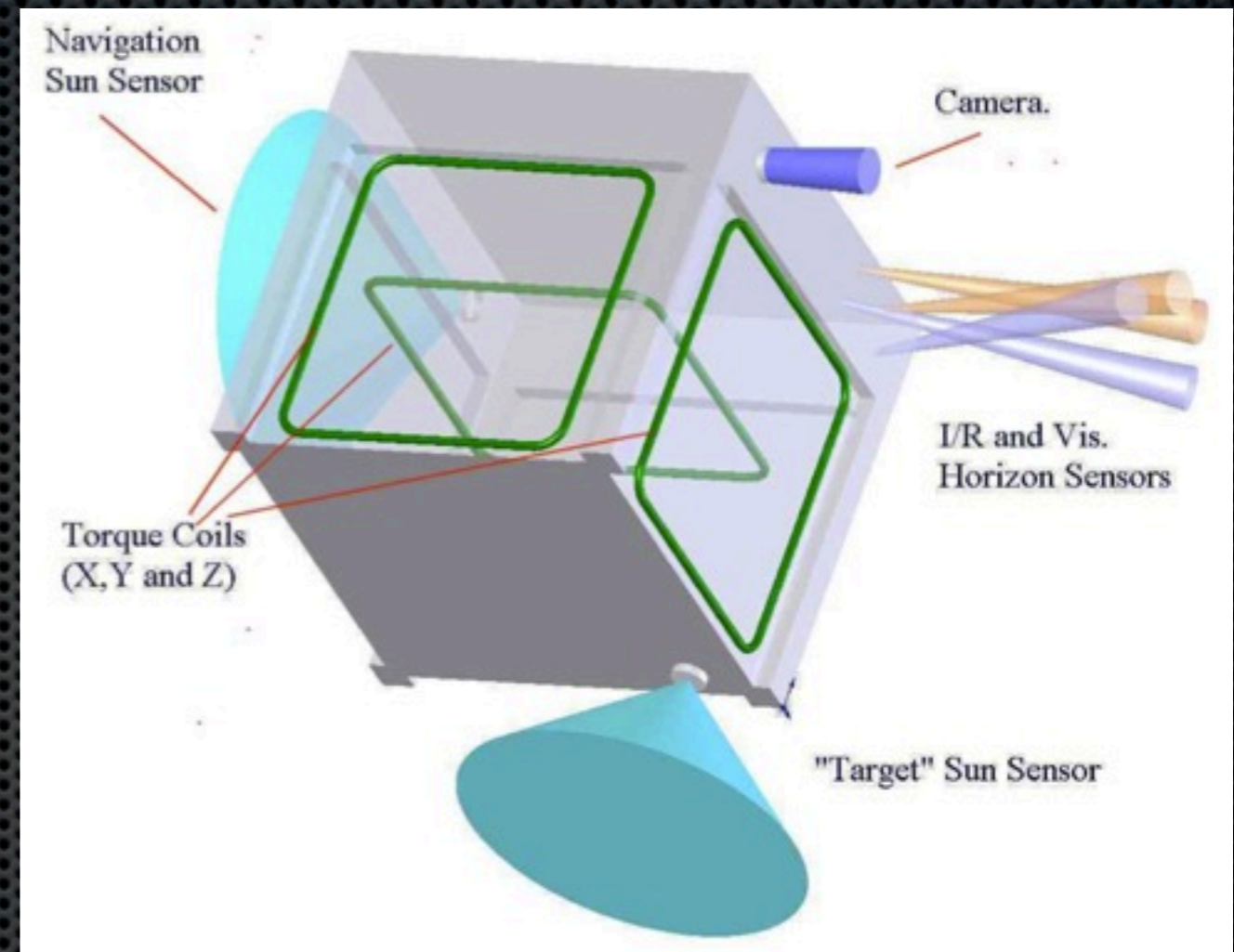
and with a standard deviation of $3.10^{-14}/^{\circ}\text{C}$, which is state-of-the-art and leading in terms of space USO performance. At the beginning of the study, the usual tools used for the simulation (mechanical simulation and thermal simulation) seemed to not be sufficient in estimating and explaining the total frequency drift in temperature. So a full 3D thermo-mechanical simulation of the USO was conducted, with introduction of the piezo-electric phenomena of the resonator^[3-8].

Fig 2 Statistical distribution of the relative frequency thermal sensitivity for the recently manufactured USOs (OUS-NG).



Rakon (acquired Temex)





KiwiSAT (Amateur Radio Sat)



About KiwiSpace

- ✦ **Charitable trust:** Professional organisation, not 'club'
- ✦ **Foundation approach:** We aim to help other NZ organisations be more successful
- ✦ **Goals:**
 - ✦ **Cultivate a generation of space scientists**
Inspiration, education, research and job opportunities
 - ✦ **Engage NZ in the global space sector**
What is the right positioning and role for NZ in the space community?



Official Launch: 12 April 2011
(50th anniversary of human spaceflight)

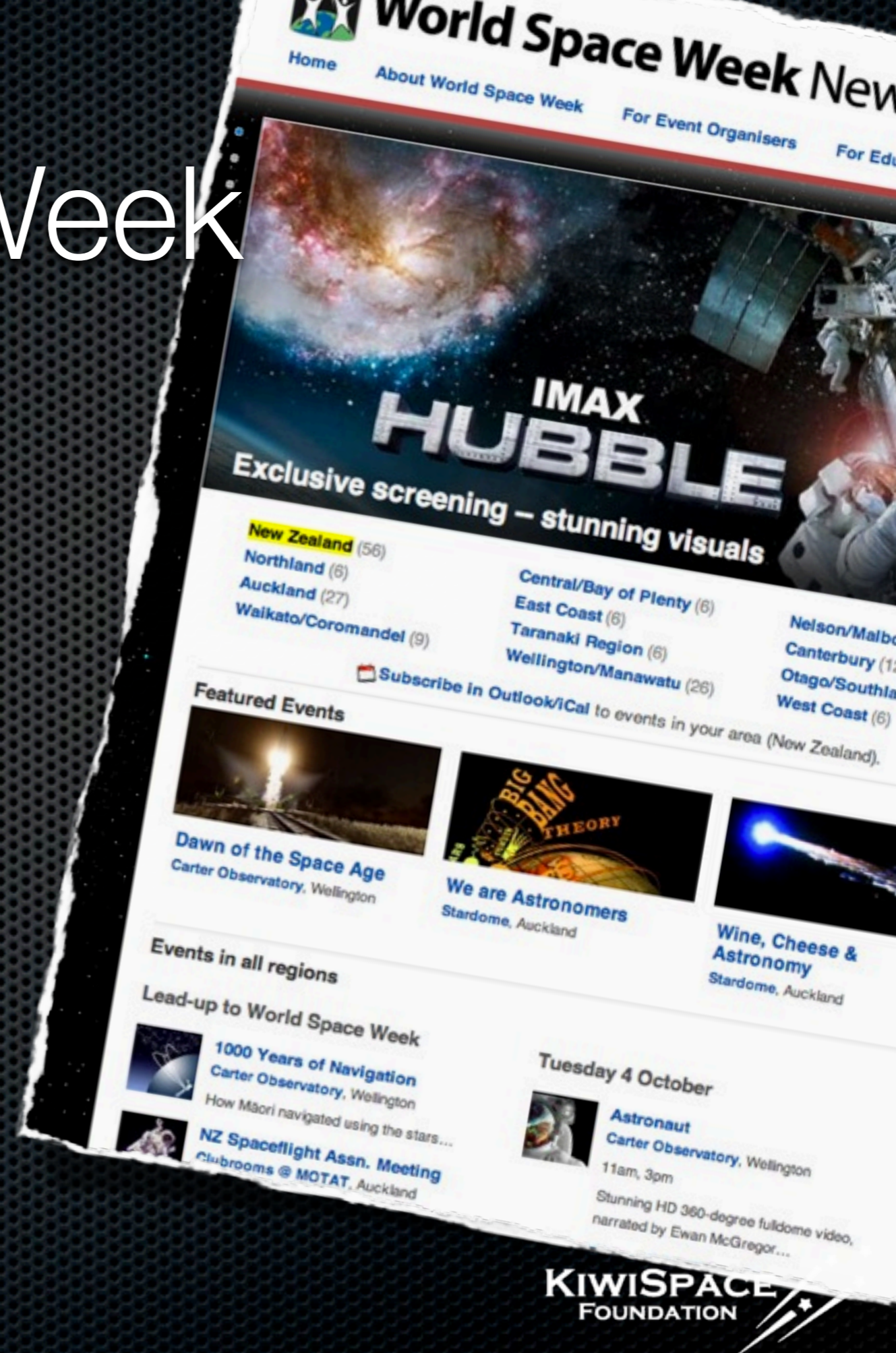


Space Balloon



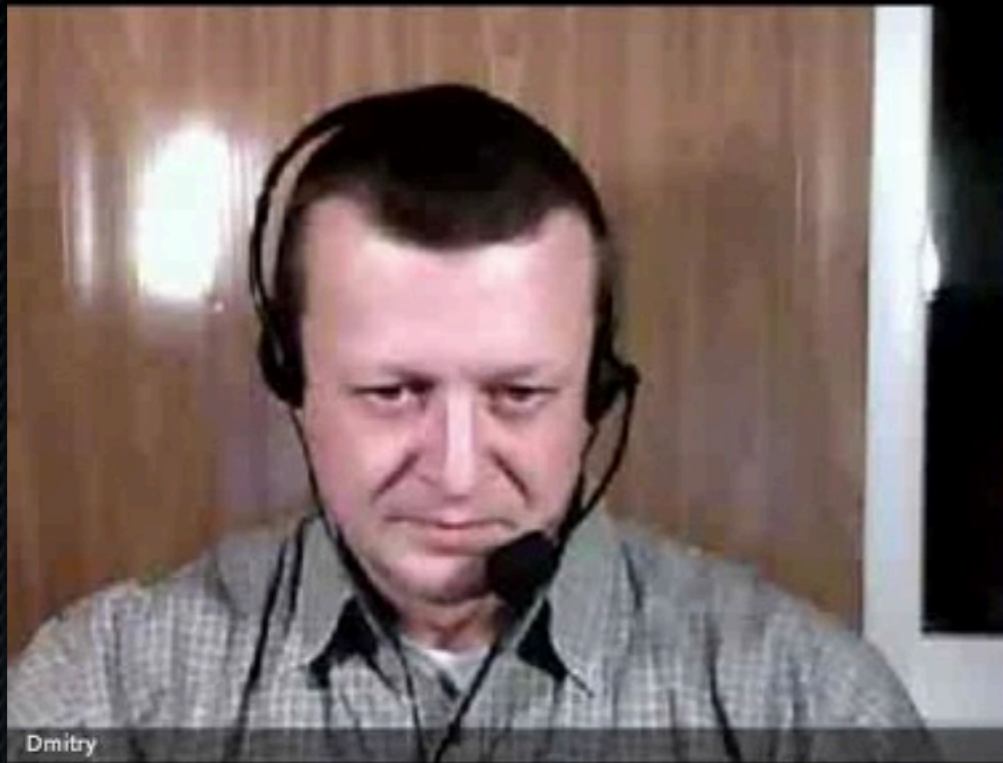
World Space Week

- **Comprehensive events website**
 - www.worldspaceweek.org.nz
- **37 unique events**
85 sessions
- **WSW Podcast Series**
Dennis Stone, Chris McKay,
Julien Girard, Marius Piso,
Robert Zubrin, ...



Video

Chat 3 (Everyone)



Attendees (6)

- Hosts (1)
 - Mark Mackay
- Presenters (1)
 - Dmitry
- Participants (4)
 - Aor
 - eden ivatt-oakley 2
 - Hutt Intermediate Sch...
 - Te Awamutu College

Astronaut School Webinars

KiwiSpace 2012

1) Unite the NZ Space Community

- ✦ World Space Week
- ✦ NZ Space Magazine
- ✦ Conference/Worshops

KiwiSpace 2012

2) Engaging education partnerships

- KiwiMars
(21 Apr - 6 May 2012)
- VSSEC Robotic Mission to Mars
- University Projects
- Rocketry Competition
- Space Balloon payloads



Thank you

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Executive Director

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