SUBJECT	**ISSTT 2020**	
DATE / PLACE	**Date: March 8/11 2020**	**Place: Tempe, Arizona**
PARTICIPANT	Alessandro Traini	
REASON FOR PARTICIPATION	Giving a talk	
WEBPAGE OF THE EVENT	https://www.isstt2020.com	

1 Agenda

SUNDAY, MARCH 8 2020

5pm - 7:30pm - Reception, Four Peaks Wilson tasting room

MONDAY, MARCH 9 2020

8:00 - Coffee and Registration

8:45 - Welcome, Nancy Gonzales - Dean of Natural Sciences, The College of Liberal Arts and Sciences, Arizona State University

9:00 - Invited Talk - *The Gal/Xgal Ultra-Long Duration Balloon-borne Spectroscopic THz Observatory (GUSTO)*, Christopher Walker, Craig Kulesa, and Paul Goldsmith

Session I: Suborbital

Chair: Chris Groppi

9:30 - *First Flight of an Almost All-CMOS 183 GHz Limb-Sounding Spectrometer System Aboard the ReckTangLE Ballooncraft*, Adrian Tang, Deacon Nemchick, Maria Alonso, Goutam Chattopadhyay, Theodore Reck, Yan Zhang, Yanghyo Kim and Mau-Chung Frank Chang

9:50 - *The Terahertz Intensity Mapper (TIM): Far-infrared Balloon Mission for Spectroscopic Galaxy Evolution Studies*, Reinier Janssen, James Aguirre, Peter Barry, Justin Bracks, Matt Bradford, Bruce Bumble, Anthony Corso, Jeff Filippini, Chris Groppi, Dan Marrone, Matthieu Bethermin, Tzu-Ching Chang, Mark Devlin, Olivier Dore, Jianyang Fu, Steve Hailey-Dunsheath, Jonathan Hoh, Gilbert Holder, Garrett Keating, Rick LeDuc, Ryan Keenan, Ely Kovetz, Guilaine Lagache, Lunjun Liu, Hamdi Mani, Justin Mathewson, Rong Nie, Phil Mauskopf, Desika Narayanan, Gergo Popping, Joseph Redford, Erik Shirokoff, Adrian Sinclair, Rachel Somerville, Isaac Trumper, Matt Underhill, Bade Uzgil, Joaquin Vieira and Jonas Zmuidzinas

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10:10 - *In-flight Performance of the BLAST-TNG Kinetic Inductance Detector Arrays and Readout Electronics*, Adrian Sinclair, Philip Mauskopf and Christopher Groppi

10:30 - Coffee Break

11:00 - *ASTHROS - Astrophysics Stratospheric Telescope for High-Spectral Resolution Observations at Submillimeter-waves: Mission Overview and Development Status*, Jose V. Siles, Jorge Pineda, Jonathan Kawamura, Christopher Groppi, Pietro Bernasconi, Joshua Gundersen and Paul Goldsmith

Session II: Missions and Concepts

Chair: Jose Siles

11:20 - *THz Space Mission to Probe the Trail of Water*, Paul Goldsmith, Dariusz Lis, Jon Kawamura, Jose Siles and Youngmin Seo

11:40 - *The SAFARI far-IR Spectrometer for SPICA*, Willem Jellema, Pieter Dieleman and Peter Roelfsema

12:00 - *Submillimeter Wave Differential Absorption Radar For Water Vapor Sounding In The Martian Atmosphere*, Omkar Pradhan, Ken Cooper, Leslie Tampari, Brian Drouin, Raquel Monje, Richard Roy, Jose Siles and Corey Cochrane

12:20 - *Millimetron Space Observatory Mission Development*, Andrey Baryshev, Andrey Smirnov, Evgeny Golubev, Mikhail Arkhipov, Elena Filina, Victor Pyshnov, Nelly Myshonkova, Sergey Fedorchuk, Igor Vinogradov, Thijs Graauw De and Sergey Likhachev

12:40 - Lunch Break

2:00 - Invited Talk - *Submillimeter Wave Power Generation with InP HEMT Technology*, Bill Deal

Session III: Schottky Diode and CMOS receivers

Chair: Imran Mehdi

2:30 - *Technology Roadmap for the HEterodyne Receiver for Origins (HERO)*, Martina Wiedner

2:50 - *High-Sensitivity Terahertz Detection Module (HSTDM) onboard China's Space Station*, Sheng-Cai Shi

3:10 - *A Single Sideband 530-600 GHz Integrated Receiver Utilizing Tunable Waveguide Filters*, Theodore Reck, Daniel Koller, Jeffrey Hesler and Eric Bryerton

3:30 - Coffee Break

3:50 - *MetOp-SG Ice Cloud Imager 183–664 GHz Front-End Engineering and Qualification Model Test Results*, Patrick Pütz, Bertrand Thomas, Michael Brandt, Guido Sonnabend, Tobias Stangier, Pia Krause, Ralf Henneberger, Monica Trasatti, Martin Philipp, Andreas Kilian, Hugh Gibson, Simon Rea, Hui Wang, Manu Henry, Chris Howe, Kai Parow-Souchon, Brian Moyna, Brian Ellison, Ana Andrés-Beivide, Marc Bergada, Noelia Alcaraz, Jaione Martinez, Michael Gotsmann and Ulf Klein

4:10 -*180 GHz CMOS Pulsed Transmitter and Heterodyne Receiver Pair for in-situ*

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Chemical Detections, Deacon Nemchick, Brian Drouin, Adrian Tang, Yanghyo Kim, Maria Alonso and M.C. Frank Chang

4:30-4:50 - *Integrated Silicon Platform for Co-planar Design of Vertically Stacked 2.06 THz Mixer Module*, Christine Chen

5:45 - Buses Leave ISTB4 to Botanical Garden - Banquet

6:00 - Reception Banquet, Desert Botanical Garden (map)

TUESDAY, MARCH 10 2020

8:00 - Coffee and Registration

8:45 - Invited Talk - *FIR Astrophysics in the US*, Kartik Sheth

Session IV: Novel Devices

Chair: Phil Mauskopf

9:15 - *Heterodyne receiving with frequency combs: towards simultaneous ultrabroadband spectroscopy*, David Burghoff

9:35 - *Wideband Superconducting Parametric Amplifiers for Millimeter-wave Instruments*, Peter Day, Nikita Klimovich, Byeongho Eom and Henry Leduc

9:55 - *Mixing with Y-Ba-Cu-O Josephson Junctions Fabricated with Focused Helium Ion Beam Irradiation*, Anthony Cortez, Ethan Cho, Hao Li, Daniel Cunnane, Boris Karasik and Shane Cybart

10:15 - *Low-power consumption THz quantum-cascade VECSEL using patch-based metasurface*, Christopher Curwen, John Reno and Benjamin Williams

10:35 - Coffee Break

11:00 - *Design Study for Optimal Performance of Tunable Antenna-Coupled Intersubband Terahertz (TACIT) Mixer*, Changyun Yoo, Jonathan Kawamura, Kenneth West, Loren Pfeiffer, Boris Karasik and Mark Sherwin

11:20 - *NOEMA heterodyne receivers performance and tuning optimization*, Christophe Risacher

Session V: THz sources

Chair: H.W. Huebers

11:40 - *Development and Testing of the 1.46 THz and 1.9 THz GUSTO Flight-Model Local Oscillator Arrays*, Jeffrey Hesler, Thomas Crowe, Cliff Rowland, Stephen Retzloff, Corey Gardner, Silvio Mancone and Ben Swartz

12:00 - *Compact Multi-Pixel Frequency Multiplied Local Oscillator Sources for Wideband Array Receivers in the 200-600 GHz & 1.4-2.7 THz Ranges*, Jose V. Siles, Jonathan Kawamura, Robert Lin, Choonsup Lee, Alain Maestrini, Darren Hayton, Ken Cooper, Maria Alonso del Pino and Imran Mehdi

12:20 - *Stabilization of terahertz quantum-cascade lasers by near-infrared optical excitation*, Martin Wienold, Tasmim Alam, Xiang Lü, Klaus Biermann, Lutz Schrottke,

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Holger T. Grahn and Heinz-Wilhelm Hübers

12:40 - Lunch Break

2:00 - *Advances in High-Power THz Sources*, Thomas Crowe, Steven Retzloff, Eric Bryerton and Jeffrey Hesler

Session VI: Spectrometers, Readouts, and IF electronics

Chair: Patricio Mena

2:20 - *Advancements in Millimeter-Wave Filter Bank Spectrometers*, Kyle Massingill, Sean Bryan, Christopher Groppi, Philip Mauskopf, Bianca Pina, Philip Rybak and Peter Wullen

2:40 - *Development of a Tone-Tracking Algorithm for Maximizing Dynamic Range of Kinetic Inductance Detectors*, Jonathan Hoh, Adrian Sinclair and Ryan Stephenson

3:00 - *Ultra-high Gain, Low Distortion Cryogenic Low-noise Amplifier for Astronomical Purposes*, Justin Mathewson, Jonathan Hoh and Hamdi Mani

3:20 - *Characterization of Cryogenic Flexible Transmission Lines Designed for the GUSTO IF Harness*, Marko Neric, Thomas Mozdzen, Hamdi Mani and Christopher Groppi

3:40 - Coffee Break

4:10-5:50 - Poster Session (poster list)

WEDNESDAY, MARCH 11 2020

8:00 - Coffee and Registration

8:45 - Invited Talk - *Steward Observatory's Radio Telescopes: Recent Advancements and Future Developments*, Alyson Ford

Session VII: Optics and Waveguide Components

Chair: Andrey Baryshev

9:15 - *4 THz beam filter based on a back to back Si-lens system*, Yuner Gan, Behnam Mirzaei, Sebastiaan van der Poel, Jose Silva, Matvey Finkel, Martin Eggens, Marcel Ridder, Ali Khalatpour, Qing Hu, Floris van der Tak and Jian Rong Gao

9:35 - *Silicon micromachined receiver calibration switch for THz frequencies*, Adrian Gomez Torrent, Umer Shah and Joachim Oberhammer.

9:55 - *Characterization of Dielectric Material at 300 GHz for Vacuum Window Applications*, Keara Carter, Edward Tong and Jake Connors

10:15 - *Contactless rotating MEMS waveguide switch for water detection at 557 GHz*, Sofia Rahiminejad, Cecile Jung-Kubiak, Mina Rais-Zadeh and Goutam Chattopadhyay

10:35 - Coffee Break

11:10 - *Optics and Feed Design for the wSMA Receiver System*, Paul Grimes, Scott Paine, Lingzhen Zeng and Edward Tong

Session VIII: SIS Mixers and Receivers

Chair: Edward Tong

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11:30 - *A Horn-coupled 4-beam Dual-polarization Balanced SIS Mixer Based on Planar-integrated Circuits*, Wenlei Shan, Shohei Ezaki, Keiko Kaneko, Akihira Miyachi, Takafumi Kojima and Yoshinori Uzawa

11:50 - *Advanced Tuning Algorithms for High-Frequency SIS Mixers*, Ronald Hesper, Jan Barkhof, Andrey Baryshev, Tobias Vos, Giorgio Siringo, Neil Phillips and Pavel Yagoubov

12:10 - *Receivers for the wideband Submillimeter Array*, Paul Grimes, Raymond Blundell, Scott Paine, Edward Tong and Lingzhen Zeng

12:30 - Lunch Break

2:00 - Invited Talk - *The Evolution of Antenna Technology: Past, Present and Future,* Constantine Balanis

2:30 - *Terahertz MgB2 HEB mixers with a 13GHz gain bandwidth*, Narendra Acharya, Evgenii Novoselov and Sergey Cherednichenko

2:50 - *Experimental Characterization of the LO Heating Effect in THz SIS mixers*, Alessandro Traini, Boon-Kok Tan, Ghassan Yassin, John Garrett, Andrey Khudchenko, Ronald Hesper, Andrey Baryshev and Valery Koshelets

3:40-4:40 - Meteorite Vault and lab Tours - ISTB4

A Novel WR1.0 Full Band Terahertz Frequency Quadrupler, Fei Yang

Thermal Transport in Graphene-based Hot Electron Bolometers with Different Electrode Contacts, Wei Miao, Feiming Li, Hao Gao, Zheng Wang, Wen Zhang, Yuan Ren, Kangmin Zhou, Shengcai Shi, Cui Yu, Zezhao He, Qingbin Liu and Zhihong Feng

Development of a 350-GHz Dual-Polarization On-Chip Spectrometer, Jing Li

Follow-up experiments of the gain and noise IF bandwidth for a Ni-NbN HEBM, Yoshihisa Irimajiri and Akira Kawakami

A Full Octave-Band OMT for Millimetre-Wave Receivers, Doug Henke

A balloon-borne heterodyne receiver for atmospheric studies of atomic oxygen, Martin Wienold, Alexey Semenov, Heiko Richter and Heinz-Wilhelm Hübers

Research on High Precision Carbon Fiber Reinforced Plastics Reflector Panels for Dome A 5m Terahertz Explorer, Yuan Qian, Xufeng Hao and Hongtao Xu

Suppressing cavity resonances in high-frequency amplifiers with metamaterial structures, David Monasterio, Nelson Castro, Francisco Pizarro and Patricio Mena

Modelling of Travelling-Wave Kinetic-Inductance Parametric Amplifiers Implemented with Artificial Transmission Lines, Patricio Mena and Daniel Valenzuela

High Dynamic Range Josephson Travelling Wave Parametric Amplifier, Kitti Ratter and Boon-Kok Tan

High Reflectance of Roughened Surface for the Integrating Sphere of SAFARI Calibration Source, Ming-Jye Wang, Chun-Lun Wang, Chuang-Ping Chiu and Ting-Hang Pei

Mid-infrared multi-beam local oscillator source based on a fiber coupled quantum cascade

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laser, Yuan Ren, Daixi Zhang, Zheng Wang, Kangmin Zhou, Jiaqiang Zhong, Dong Liu, Wei Miao, Wen Zhang and Shengcai Shi

Characterization System for SIS Frequency Converters based on Scalar Mixer Calibration Technique, Takafumi Kojima, Yoshinori Uzawa, Wenlei Shan and Yuto Kozuki

Planar silicon metamaterial lenses with integrated anti-reflection coatings for frequencies around 150 GHz, Julie Jauk, Guoliang Wang, Victor Moreno, Magali Parioleau, Anne-Laure Fontana, Samuel Leclercq and Eduard Driessen

Development of wideband circular polarizer in 70-118 GHz band, Sho Masui, Yutaka Hasegawa, Toshikazu Onishi, Hideo Ogawa, Satoshi Ochiai and Issei Watanabe

Preliminary Design of a Multibeam Receiver for the SMA, John Garrett, Paul Grimes and Edward Tong

Performance of the SIS terahertz photon detector, Hajime Ezawa, Hiroshi Matsuo, Masahiro Ukibe, Go Fujii and Shigetomo Shiki

Waveguide Components for wSMA Frontends, Lingzhen Zeng, C Edward Tong and Paul Grimes

Development of a Dual-Band Metamaterial Lens for Cubesat Water Observation, Cassandra Whitton, Christopher Groppi, Philip Mauskopf, Jose Siles and Adrian Tang

Development of readout electronics for SIS photon counting detectors, Hiroshi Matsuo, Hajime Ezawa, Ryohei Noji and Saho Kawahara

Development of 109-pixel NbTiN-Al MKID array for the 100-GHz band astronomical observations, Yosuke Murayama, Tom Nitta, Makoto Nagai, Ryotaro Hikawa, Ryuji Suzuki, Wenlei Shan, Hiroshi Matsuo, Akihira Miyachi, Matthias Kroug, Shohei Ezaki, Yutaro Sekimoto, Takashi Noguchi, Masato Naruse, Nario Kuno and Naomasa Nakai

High Power Amplifier Modules from 110 to 200 GHz, Theodore Reck, Zach Griffith and Eric Bryerton

Reliability study of THz Schottky mixers and HBV frequency multipliers for space applications, Vladimir Drakinskiy, Josip Vukusic, Daniel Heinerås, Peter Sobis, Vaclav Valenta, Marie-Genevieve Perichaud, Fernando Martinez Martin and Jan Stake

Performance Comparison of Fabricated 90 Degree Waveguide Twists using Direct Milling, Usman Shehryar

Tuning of superconducting Ti and Ti/Au bilayer films for transition-edge sensors, Wen Zhang, Zheng Wang, Pei Zhan Li, Yue Gen, Jia Qiang Zhong, Wei Miao, Yuan Ren, Kang Ming Zhou, Qi Jun Yao and Sheng Cai Shi

A 200 GHz cloud radar multiplexing antenna, Richard Wylde, Stuart Froud, Manju Henry, Peter Huggard, Duncan Robertson, Soe Min Tun and Hui Wang

1 to 8 beam distributor at 4.7 THz for GUSTO, Behnam Mirzaei, Matvey Finkel, Jose Silva, Wouter Laauwen, Christopher Groppi, Ali Khalatpour, Qing Hu, Abram Young, Christopher Walker and Jian Rong Gao

Design, Fabrication and Characterization of Waveguide to Substrate Transition Based on

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Unilateral Substrateless Finline Structures, Cristian Lopez, Vincent Desmaris, Denis Meledin, Alexey Pavolotsky and Victor Belitsky

Spline-Profile Diagonal Horn Transmitter at 104 GHz Suitable for LLAMA Observatory Holography Measurements, Daniele Ronso Lima, Rocio Molina, Catalina Medina, Danilo Zanella, Ricardo Finger, Jacques Lepine and Andrey Baryshev

Design, Construction and Characterization of a Dichroic Filter for Dual-Band Observation with ALMA, Daniel Montofre, Fausto Patricio Mena and Andrey Baryshev

Development of THz Superconducting HEB Receiver Systems for Balloons, Aircraft, SmallSats and Future Large Missions, Jonathan Kawamura

Photo-Induced Coded-Aperture Terahertz Imaging using Mesa-Array Structures for Approaching Subwavelength Resolution, Yijing Deng, Yu Shi, Jun Ren, Patrick Fay and Lei Liu

A 1.37 THz Waveguide-based 2 X 2 Beam Divider Fabricated by Two Microfabrication Technologies, Haotian Zhu, Jerome Valentin, Thibaut Vacelet, Sylwester Bargiel, Samuel Queste, Laurent Robert, Djaffar Belharet, Etienne Herth, Yan Delorme and Martina Wiedner

Absorber Optimization Study for the Terahertz Intensity Mapper (TIM), Rong Nie, Reinier Janssen, Matt Bradford, Jeff Filippini and Steve Hailey-Dunsheath

Meissner Effect Transistor, Siddhartha Sirsi and Christopher Walker

Design concept of the W-Band multibeam receiver for the SRT, Alessandro Navarrini, Luca Olmi, Renzo Nesti, Pasqualino Marongiu, Pierluigi Ortu, Luca Cresci, Andrea Orlati, Alessandro Scalambra and Alessandro Orfei

Developing High-Sensitivity Graphene Terahertz Detectors Through A High-Yield Nanofabrication Process, Panagiotis Theofanopoulos and Georgios Trichopoulos

A small satellite with a dual-frequency heterodyne spectrometer for the detection of atomic oxygen in the atmosphere of Earth, H Richter, J Hildebrandt, T Roth, M Lengowski, C Philpot, A Braukhane, T Delovski, M Wienold, S Klinkner and Heinz-Wilhelm Hübers

2 Notes

Because of the increasing coronavirus threat my inbound flight was cancelled. I had to book the first available flight in order to get back in England before the USA travel block to/from Europe.

3 IDEAS / Conclusions

The International Symposium on Space Terahertz Technology is one of the key conferences in the field of THz astronomy and has been a great opportunity to discuss with other international researchers and advertise the RadioNet project to a wider

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audience. The conference topics are highly relevant to the WP5 JRA (AETHRA) activities in which my research is involved.

In my talk “Experimental Characterization of the LO Heating Effect in THz SIS mixers” I have discussed one of the main issue related to SIS mixers operating beyond the THz threshold. Receivers used in ALMA, for example, are limited in frequency coverage above band 10 because of the low energy gap of Nb. Therefore, there has been an increasing interest to fabricate junctions with higher gap superconductors such as NbN and NbTiN in order to achieve supra-THz sensitivity. These devices are known to suffer of a so called heating effect. I have characterised experimentally the impact of such heating on the SIS mixer performance and proposed an approach to solve the problem. This work will be beneficial for the community working on high-gap superconductor THz mixers for next generation heterodyne receivers.

My talk will result in two publications, one paper is to be published in the conference proceeding and the second in the IEEE Transactions on Terahertz Science and Technology (currently under review).

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