

Curriculum Vitae of Yuh-Jing Hwang

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Experience

Jan. 2014 – now **Associate Research Fellow** **ASIAA**

The Atacama Large Millimeter Array (ALMA) Project

- Developed Band-1 receivers, including system design study, design and development of cold cartridge assembly and warm cartridge, development of the standard testing procedure, and warm receiver components (35 -52GHz low-noise amplifiers and cascode HEMT mixers) development /pre-production; Analysis and design improvement of the waveguide high pass filters, other microwave
- Long-term Development, including (i) theoretical investigation on the input signal power saturation and two-tone intermodulation problems of the diode and cold transistor mixers, (ii) feasibility study of the ultra-broadband heterodyne receiver with full instantaneous bandwidth.

Green Bank Telescope 700-945MHz Array Receiver Project

- Constructed and upgraded the Green Bank Telescope 700-945MHz array receiver for $z = 0.5 - 1.0$ highly red-shifted Hydrogen line survey, including (i) revised cryogenic chamber, (ii) revised designed and tested short backfire antenna (SBA) assembly, (iii) developing cryogenic low-noise amplifiers, (iv) integration and testing of the system on-site, (v) array supporting structure design and development, and (v) production of the 7-element array (pending due to shortage of funding).

Postdoctoral Fellows Supervised

- Dr. Yi-Ching Wu (project support engineer: Mar. 2018 – now), research Topics: (1) ultra-broadband millimeter-wave cascode transistor mixers using 40nm and 28nm Si CMOS process to cover ALMA band-1, band-2, and band-3 with the same design.
- Dr. Yue-Fang Kuo (engineer: Sep. 2008- July 2010, posdoc: Aug. 2010 – Sept. 2015), research topics: (1) Phase-lock circuit optimization for the wideband varactor-tuned GaAs hetero-bipolar transistor (HBT) voltage control oscillator, (2) YIG-Based local oscillator for ALMA Band-1 receivers, (3) Down-converter chain for ALMA Band-1 receiver: integrated testing and verification.
- Dr. Chi-Chang Lin (July 2011 – Feb. 2015), research topics: (1) fullband millimeter-wave waveguide-to-microstrip transition probes with ground sleeve structure, (2) co-centric sleeve for broadband impedance tuning and antenna pattern optimization of the short backfire antenna, (3) ultra-broadband planar quadrature 3-dB hybrid coupler for extended ALMA band-1 receivers in

30 – 54 GHz. (4) antenna pattern optimization of the corrugated short backfire antenna, (5) Broadband orthomode transducer for ALMA Band-1 receivers.

Assistants / Engineers Supervised

- Mr. Chin-Ting Ho (March 2011 - now): mechanical, vacuum, and cryogenic component / system design, including the 10-K cold-finger mini-cryostat for GBT 800MHz receiver, 4-K millimeter-wave component testing dewar, 10-K cryogenic probe station chamber for microwave circuit and transistor characterization, mechanical supporting structure for GBT 800MHz receiver, SBA antenna mechanical design, and mechanical design for microwave/ millimeter-wave components.
- Mr. Chien-Feng Lee (October 2014 – February 2017) and Mr. Shou-Ting Jian (October 2014 – Now): electrical, microwave and millimeter-wave component development and measurement, automation of the measurement system.
- Mr. Ping-Hsueh Yang (September 2016 – February 2018): the design and development of the microwave and antenna components for ALMA band-1 project, GBT 800MHz array receivers, and infrastructure of the microwave device laboratory.
- Mr. Chien Cheng (February, 2017 – Now) the testing items on the ALMA band-1 receiver development with intensive learning and working in Taichung ALMA band-1 integrated testing laboratory.

Nov. 2005 – Jan. 2014 Assistant Research Fellow

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The Atacama Large Millimeter Array (ALMA) Project

- Developed Band-1 receivers, including system design study, monolithic microwave integrated circuits (MMIC) packaging, and cryogenic testing of Q-band MHEMT/PHEMT low-noise amplifiers and mixers.
- Developed local oscillator based on wideband GaAs heterojunction bipolar transistor (HBT) voltage-controlled oscillator (VCO), and YIG oscillator, including the integration and testing of phase-lock loop.
- Design and construction of the Close-cycle cryogenic Probe Station for microwave and millimeter-wave electronic device characterization up to 50GHz
- Prototype down-converter module and 50-GHz vacuum feedthru development
- Cold cartridge assembly (CCA) and warm cartridge assembly design

Green Bank Telescope 700-945MHz Array Receiver Project

- Constructed and upgraded the Green Bank Telescope 700-945MHz array receiver for $z = 0.5 - 1.0$ highly red-shifted Hydrogen line survey, including (i) designed and tested a miniaturized cryogenic

chamber, (ii) designed and tested short backfire antenna (SBA) assembly, (iii) fabricated and tested cryogenic SiGe low-noise amplifiers, and (iv) integration and testing of the system on-site.

The Submillimeter Array (SMA) Project of Taiwan (till 2010)

- Tested the noise temperature and quasi-optics beam pattern of the 325–425 GHz band SIS receivers and improved the receiver system beam mapping alignment for the Antenna 7 and 8 to activate the dual-polarization function between 250 – 354 GHz receiver and 325 – 425 GHz receivers.
- Upgraded SMA 600-696GHz receivers, including the preparation of local oscillators and optics inserts.

The Array of Microwave Background Anisotropy (AMiBA) Project (till 2007)

- Improved design and produced local oscillator / intermediate frequency (LO/IF) module, and 21GHz local oscillator central signal source module for 7-element array.
- Designed, produced and tested the sub-harmonically pumped (SHP) diode mixer modules for 7-element and 13-element array receivers.
- Integrated microwave and millimeter-wave subsystem of the calibration system.
- Initially designed, assembled and near-field measurement of AMiBA 1.2-meter parabolic reflector antenna.

Miscellaneous Project

- Applied millimeter-wave signal source for imaging technology by collaborating with Graduate Institute of Electro-Optics Engineering of National Taiwan University to operate the solid-state millimeter-wave signal source for sub-terahertz imaging and material spectrum studying.

Undergraduate Students Supervised

- Chih-Yuan Lin, Department of Electrical Engineering, National Central University, July 2007 – June 2008. Research topic: Compact Microwave and RF Phasor Voltmeter Module.
- Jheng-Si Chen, Department of Physics, National Taiwan University, July 2008 – June 2009. Research topic: A Planar Microwave Circuit Unit for Astrophysical Polarimetric Measurement.
- Ming-Jay Liu, Department of Electrical Engineering, Yuan-Ze University, July 2011- now. (Co-supervised with Dr. Yue-Fang Kuo) Research topic: Development of Phase Locked Oscillator with Switchable Loop Filter.
- Robin Lee, Department of Electronic Engineering, Chinese University of Hong Kong, July 2013 – now. (Co-supervised with Dr. Yue-Fang Kuo and Dr. Chau-Ching Chiong) Research Topics: Directly digitized heterodyne receiver.
- Ching-Chi Lin, Department of electrical engineering, Chung-Yuan Christian University, July 2013 – now. (Co-supervised with Dr. Yue-Fang Kuo and Dr. Chau-Ching Chiong) Research Topics: Upper sideband (USB) and sideband separating (2SB) down-converter for 7-mm broadband radio astronomical heterodyne receiver.

Master Student Supervised

- Tzu.-Chueh Hong, Department of Electrical Engineering, National Central University, Sep. 2006 – July 2008, thesis title: Calibration Signal Source for Array of Microwave Background Anisotropy.

Postdoctoral Fellows Supervised

- (Dr. Yue-Fang Kuo and Dr. Chi-Chang Lin, See page 1 for detail.)

Assistants / Engineers Supervised

- Mr. Wei-Ting Wong (Dec. 2007 – March 2011): microwave and millimeter-wave components packaging and testing for ALMA Band-1 front-end.
- Mr. Ching-Chi Chuang (July 2011- March 2014): microwave and millimeter-wave component: MMIC and bias micro-assembling, bonding wires, room-temperature and cryogenic electronic and microwave testing of low-noise amplifier and mixer for ALMA Band-1 receivers, and cryogenic LNA development for GBT 800MHz receivers.
- Mr. Chin-Ting Ho (March 2011 - now): mechanical, vacuum, and cryogenic component / system design, including the 10-K cold-finger mini-cryostat for GBT 800MHz receiver, 4-K millimeter-wave component testing dewar, 10-K cryogenic probe station chamber for microwave circuit and transistor characterization, mechanical supporting structure for GBT 800MHz receiver, SBA antenna mechanical design, and mechanical design for microwave/ millimeter-wave components.

List of Intramural and Extramural Funding

- National Science Council of Taiwan, NSC97-2221-E-001-018-
Title: “Polarization theory and measurement techniques of the microwave and millimeter- wave components and systems,” period: Aug. 2008 – July 2009, amount: NTD 598K.
- National Science Council of Taiwan, NSC98-2221-E-001 -003-
Title: “Polarization theory and measurement techniques of the microwave and millimeter- wave components and systems (II),” period: Aug. 2009 – May 2011, amount: NTD 658K.
- National Science Council of Taiwan, NSC100-2221-E001-020-
Title: “Research on the Graphene Planar Circuits and Signal Generation and Detection Devices for Microwave to Submillimeter Wave,” period: Aug. 2009 – May 2011, amount: NTD 508K.
- North America ALMA (Atacama Large Millimeter Array) Science Center (NAASC), Grant for Studies of Proposed Development Upgrades of ALMA
Title: “ALMA Band-1 Receiver Development Study,” period: May 2012 – May 2013.

Other Significant Contributions

▪ **Invited Talks**

1. “Heterodyne Receivers: Systems and Components Development in ASIAA,” at Department of Electrical Engineering, National Central University, December 20, 2006. (colloquium)

2. "Observe to the Universe by Radio: Engineering for Highly-Sensitive Radio Astronomical Receivers," at Department of Electrical Engineering, National Dong-Hua University, December 12, 2008. (colloquium)
3. "Mapping the Starry Sky by Radio: Engineering for Radio Astronomy," at Department of Electronic Engineering, National Taiwan University of Science and Technology, May 04, 2009. (colloquium)
4. "Radio Astronomical Instrumentation: Development in Taiwan during Past Two Decades and Future Trend," Electromagnetics Workshop – A Bridge to the Future 2016, Taiwan Electromagnetic Industry-Academia Consortium, January 2016.
5. "Radio Engineers in Astronomical Research," Research Group of Electromagnetic Waves, Graduate Institute of Communication Engineering, National Taiwan University, April 27, 2016 (Colloquium).

▪ **Scientific Organizing Committees**

1. 9th Workshop on the Submillimeter-wave Receiver Technologies in Eastern Asia, November 18-20, 2008, Taipei, Taiwan.
2. 2011 National Symposium of Telecommunication, November 18-19, 2009, Hualien, Taiwan.

▪ **Professional Activities**

1. Member of IEEE Microwave Theory and Technology Society (MTT-S) P1785 Working Group (WG) on "Waveguides for Millimeter and Sub-Millimeter Wavelengths" (2009).
2. Referee for: IEEE Trans. Microwave Theory Tech. (2011), European Microwave Conference (2011), IEEE International Microwave Workshop Series on Millimeter Wave Integration Technologies (2011), and 2011 National Symposium for Telecommunication.
3. Reviewer for thesis defense in Institute of Photonic, National Taiwan University (July 2007 for Ph. D., Jan. 2009 for M.Sc), Department of Electrical Engineering, National Central University (July 2008 for M. Sc.), Institute of Communication Engineering, National Taiwan University (Sep. 2008 and July 2013 for M. Sc.), Department of Electrical Engineering, National Dong-Hua University (July 2010 for M. Sc. and Ph. D.), Department of Electrical Engineering, National Chung-Cheng University (July 2017 for M. Sc.).
4. Member of committees in ASIAA: Summer Student Committee (2007 – now), Building Committee (2011 – now), and Research Manpower committee (2013- 2014); Chair of Summer Student Committee (June 2010 –Oct. 2014).

Oct. 1996 – Nov. 2005 Research Assistant

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- Tested the noise temperature and quasi-optics beam pattern of the SMA 600-696 GHz band receivers.
- Tested the bias electronics, noise temperature of the SMA 216 GHz and 300GHz band receivers.
- Measured microwave, millimeter-wave and submillimeter-wave for SMA LO and IF components.

- Designed and developed the W-band GaAs MMIC for the AMiBA.
- Designed and tested the noise temperature and conversion gain of the AMiBA receivers, both prototype receiver #1 and 2, production receiver #1 and #2.

June 1995- Oct. 1996 NSC Assistant

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- Planned the space and instruments for the receiver laboratory of the SMA-Taiwan project.
- Planned the receiver components for the SMA projects.
- Tested and measured the SMA receiver IF and LO components.

Oct. 1993- May 1995 Platoon Leader, Ensign (Second Lieutenant) R.O.C. Navy

Education

Jan. 2005	Ph. D., Communication Engineering National Taiwan University, Taipei, Taiwan, R. O. C. Dissertation: Mixer Development and Receiver Measurement for Millimeter- and Submillimeter-wave Astronomy
June 1993	M. Sc., Electrical Engineering National Taiwan University, Taipei, Taiwan, R. O. C. Thesis: Antenna Array of Transportable VHF Radar System
June 1991	B. Sc. in Electrical Engineering National Taiwan University, Taipei, Taiwan, R. O. C.

Honors

2001 Chip Implementation Center (CIC) Multi-Project Chip Service award for chip design entitled “W-Band Subharmonically-Pumped HEMT diode Mixer”

2001 CIC Multi-Project Chip Service award for chip design entitled “2-12 GHz Wideband Feedback Amplifier”

Personal Information

Date of Birth: August 05, 1969
Place of birth: Chang-Hua, Taiwan
Nationality: Taiwan, R.O.C.
Marital Status: Married, with one child.

Professional Membership and Research Interests

- Member, Institute of Electrical and Electronic Engineer (IEEE)

- Research interests include instrumentations and applications of the devices, components, and systems of millimeter-wave, submillimeter-wave and far-infrared heterodyne receiver; design, packaging and testing of Millimeter-wave monolithic integrated circuits (MMIC) and modules.
- Publication list is enclosed below.

Publication List of Yuh-Jing Hwang

Part I. Refereed Publications

1. **Y.-J. Hwang**, C.-H. Lien, Huei Wang, R. G. Gough, M. W. Sinclair, and T.-H. Chu, "A 78-114 GHz monolithic subharmonically pumped GaAs-based HEMT diode mixer," *IEEE Microwave Wireless Comp. Letters*, vol. 12, no. 6, pp. 209-211, June 2002.
2. **Y.-J. Hwang**, H. Wang, and T.-H. Chu, "A W-band Subharmonically Pumped Monolithic GaAs-Based HEMT Gate Mixer," *IEEE Microwave Wireless Compo. Letters*, vol. 14, no. 7, pp. 313-315, July 2004.
3. P. T. P. Ho, M.-T. Chen, T.-D. Chiueh, T.-H. Chiueh, T.-H. Chu, H. Jiang, P. Koch, D. Kubo, C.-T. Li, M. Kesteven, K.-Y. Lin, G.-Ch. Liu, K.-Y. Lo, C.-J. Ma, R. N. Martin, K.-W. Ng, H. Nishioka, F. Patt, J. B. Peterson, P. Raffin, H. Wang, **Y.-J. Hwang**, K. Umetsu, J.-H. P. Wu, "The AMiBA Project," *Modern Physics Letters A*, vol. 19, no. 13-16, pp.993-1000, 2004.
4. **Y.-J. Hwang**, R. Rao, R. Christensen, M.-T. Chen, and T.-H. Chu, "Submillimeter-wave phasor beam-pattern measurement based on two-stage heterodyne mixing with unitary harmonic difference," *IEEE Trans. Microwave Theory Tech.*, vol.55, pp. 6, pp.1200-1208, June 2007.
5. J.-Y. Lu, C.-C. Kuo, C.-M. Chiu, H.-W. Chen, **Y.-J. Hwang**, C.-L. Pan, and C.-K. Sun, "THz interferometric imaging using subwavelength plastic fiber based THz endoscopes," *Optics Express*, vol. 16, no.4, pp. 2494-2501, Feb. 2008.
6. J.-Y. Lu, C.-M. Chiu, C.-C. Kuo, C.-H. Lai, and H.-C. Chang, **Y.-J. Hwang**, C.-L. Pan, and C.-K. Sun, "Terahertz scanning imaging with a subwavelength plastic fiber," *Applied Physics Letters*, vol. 92, #084102, Feb. 2008.
7. P. T. P. Ho, P. Altimirano, M. Birkinshaw, S.-W. Chang; C.-H. Chang, K.-J. Chen, M.-T. Chen, T.-D. Chiueh, T.-H. Chiueh, T.-H. Chu, C.-C. Han, C.-W. Hung, Y.-D. Huang, W.-Y. P. Hwang, **Y.-J. Hwang**, H. Jiang, M. Kesteven, P. Koch, D. Kubo, K. Lancaster, C.-T. Li, H. Liang, Y.-W. Liao, J. Lim, Y.-S. Lin, K.-Y. Lin, G.-C. Liu, K.-Y. Lo, C.-J. Ma; P. Martin-Cocher, R. N. Martin, S. Molnar, K.-W. Ng, H. Nishioka, C.-G. Park, F. Patt, J. B. Peterson, P. Raffin, F. Romano, H. Wang, K. Umetsu, F.-C. Wang, J.-H. P. Wu, "The Yuan-Tseh Lee AMiBA Project," *Modern Physics Letters A (MPLA)*, vol.23, no.17/20, pp.1243 – 1251, June 2008.
8. J.-H. P. Wu, T.-H. Chiueh, C.-W. Huang, Y.-W. Liao, F.-C. Wang, P. Altimirano, C.-H. Chang, S.-H. Chang, S.-W. Chang, M.-T. Chen, G. Chereau, C.-C. Han, P. T. P. Ho, Y.-D. Huang, **Y.-J. Hwang**, H. Jiang, P. Koch, D. Kubo, C.-T. Li, K.-Y. Lin, G.-C. Liu, P. Martin-Cocher, S. Molnar, H. Nishioka, P. Raffin, K. Umetsu, M.

- Kesteven, W. Wilson, M. Birkinshaw, K. Lancaster, "AMiBA: First Year Results for Sunyaev-Zel'Dovich Effect," *Modern Physics Letters A (MPLA)*, vol.23, no.17/20, pp.1675 – 1686, June 2008.
9. P. T. P. Ho, P. Altamirano, C.-H. Chang, S.-H. Chang, S.-W. Chang, C.-C. Chen, K.-J. Chen, M.-T. Chen, C.-C. Han, W. M. Ho, Y.-D. Huang, **Y.-J. Hwang**, F. Ibañez-Romano, H. Jiang, P. M. Koch, D. Y. Kubo, C.-T. Li, J. Lim, K.-Y. Lin, G.-C. Liu, K.-Y. Lo, C.-J. Ma, R. N. Martin, P. Martin-Cocher, S. M. Molnar, K.-W. Ng, H. Nishioka, K. E. O'Connell, P. Oshiro, F. Patt, P. Raffin, K. Umetsu, T. Wei, J.-H. P. Wu, T.-D. Chiueh, T. Chiueh, T.-H. Chu, C.-W. L. Huang, W.Y. P. Hwang, Y.-W. Liao, C.-H. Lien, F.-C. Wang, H. Wang, R.-M. Wei, C.-H. Yang, M. Kesteven, J. Kingsley, M. M. Sinclair, W. Wilson, M. Birkinshaw, H. Liang, K. Lancaster, C.-G. Park, U.-L. Pen, and J. B. Peterson, "The Yuan-Tseh Lee Array for Microwave Background Anisotropy," *Astrophysical Journal*, vol. 694, no. 2, pp.1610-1618, April 2009.
 10. J.-H. P. Wu, P. T. P. Ho, C.-W. L. Huang, P. M. Koch, Y.-W. Liao, K.-Y. Lin, G.-C. Liu, S. M. Molnar, H. Nishioka, K. Umetsu, F.-C. Wang, P. Altamirano, M. Birkinshaw, C.-H. Chang, S.-H. Chang, S.-W. Chang, M.-T. Chen, T. Chiueh, C.-C. Han, Y.-D. Huang, **Y.-J. Hwang**, H. Jiang, M. Kesteven, D. Y. Kubo, K. Lancaster, C.-T. Li, P. Martin-Cocher, P. Oshiro, P. Raffin, T. Wei, and W. Wilson, "Array for Microwave Background Anisotropy: Observations, Data Analysis, and Results for Sunyaev-Zel'Dovich Effects," *Astrophysical Journal*, vol. 694, no. 2, pp. 1619- 1628, April 2009.
 11. K.-Y. Lin, C.-T. Li, P. T.P. Ho, C.-W. L. Huang, Y.-W. Liao, G.-C. Liu, P. M. Koch, S. M. Molnar, H. Nishioka, K. Umetsu, F.-C. Wang, J.-H. P. Wu, M. Kesteven, M. Birkinshaw, P. Altamirano, C.-H. Chang, S.-H. Chang, S.-W. Chang, M.-T. Chen, P. Martin-Cocher, C.-C. Han, Y.-D. Huang, **Y.-J. Hwang**, F. Ibañez-Roman, H. Jiang, D. Y. Kubo, P. Oshiro, P. Raffin, T. Wei, W. Wilson, K.-J. Chen, and T. Chiueh, "AMiBA: System Performance," *Astrophysical Journal*, vol. 694, no. 2, pp. 1629-1636, April 2009.
 12. Hi. Nishioka, F.-C. Wang, J.-H. P. Wu, P. T.P. Ho, C.-W. L. Huang, P. M. Koch, Y.-W. Liao, K.-Y. Lin, G.-C. Liu, S. M. Molnar, K. Umetsu, M. Birkinshaw, P. Altamirano, C.-H. Chang, S.-H. Chang, S.-W. Chang, M.-T. Chen, C.-C. Han, Y.-D. Huang, **Y.-J. Hwang**, H. Jiang, M. Kesteven, D. Y. Kubo, C.-T. Li, P. Martin-Cocher, P. Oshiro, P. Raffin, T. Wei, and W. Wilson, "Tests of AMiBA Data Integrity," *Astrophysical Journal*, vol. 694, no. 2, pp. 1637-1642, April 2009.
 13. K. Umetsu, M. Birkinshaw, G.-C. Liu, J.-H. P. Wu, E. Medezinski, T. Broadhurst, D. Lemze, A. Zitrin, P. T. P. Ho, C.-W. L. Huang, P. M. Koch, Y.-W. Liao, K.-Y. Lin, S.

- M. Molnar, H. Nishioka, F.-C. Wang, P. Altamirano, C.-H. Chang, S.-H. Chang, S.-W. Chang, M.-T. Chen, C.-C. Han, Y.-D. Huang, **Y.-J. Hwang**, H. Jiang, M. Kesteven, D. Y. Kubo, C.-T. Li, P. Martin-Cocher, P. Oshiro, P. Raffin, T. Wei, and W. Wilson, "Mass and Hot Baryons in Massive Galaxy Clusters from Subaru Weak-Lensing and AMiBA Sunyaev-Zel'Dovich Effect Observations," *Astrophysical Journal*, vol. 694, no. 2, pp. 1643-1663, April 2009.
14. M.-T. Chen, C.-T. Li, **Y.-J. Hwang**, H. Jiang, P. Altamirano, C.-H. Chang, S.-H. Chang, S.-W. Chang, T.-D. Chiueh, T.-H. Chu, C.-C. Han, Y.-D. Huang, M. Kesteven, D. Kubo, P. Martin-Cocher, P. Oshiro, P. Raffin, T. Wei, H. Wang, W. Wilson, P. T. P. Ho, C.-W. Huang, P. Koch, Y.-W. Liao, K.-Y. Lin, G.-C. Liu, S. M. Molnar, H. Nishioka, K. Umetsu, F.-C. Wang, and J.-H. P. Wu, "AMiBA: Broadband Heterodyne Cosmic Microwave Background Interferometry," *Astrophysical Journal*, vol. 694, no. 2, pp. 1664-1669, April 2009.
 15. C.-M. Chiu, H.-W. Chen, Y.-R. Huang, **Y.-J. Hwang**, W.-J. Lee, H.-Y. Huang, and C.-K. Sun, "All-THz fiber-scanning near-field microscopy," *Optics Letters*, vol. 34, no. 7, pp. 1084-1086, April 2009.
 16. H.-W. Chen, C.-M. Chiu, C.-H. Lai, J.-L. Kuo, P.-J. Chiang, **Y.-J. Hwang**, H.-C. Chang, and C.-K. Sun, "Sub-wavelength dielectric-fiber-based THz coupler," *IEEE J. Lightwave Tech.*, vol. 27, no. 11, pp. 1489-1495, June 2009.
 17. Y.-S. Lin, Y.-S. Hsieh, C.-C. Chiong, **Y.-J. Hwang**, "Q-band GaAs bandpass filter design for ALMA band-1," *IEEE Microwave Wireless Comp. Letter*, vol. 19, no. 6, pp. 353-355 June 2009.
 18. C.-H. Lai, Y.-C. Hsiuh, H. -W. Chen, **Y.- J. Hwang**, H. -C. Chang, and C. -K. Sun, "Low-index terahertz pipe waveguides," *Optics Letters*, vol. 34, no. 21, pp. 3457-3459, Nov. 2009.
 19. Chi-Kuang Sun, Yu-Wei Huang, Tzu-Fang Tseng, Chung-Chiu Kuo, **Yuh-Jing Hwang**, "THz fiber-based swept-source imaging radar," *Optics Letters*, vol. 35, no. 9, pp. 1344-1346, May 2010.
 20. Y.-W. Liao, J.-H. P. Wu, P.T.-P. Ho, C.-W. L. Huang, P. M. Koch, K.-Y. Lin, G. -C. Liu, S. M. Molnar, H. Nishioka, K. Umetsu, F. -C. Wang, P. Altamirano, M. Birkinshaw, C. -H. Chang, S. -H. Chang, S. -W. Chang, M.-T. Chen, T. Chiueh, C.-C. Han, Y.-D. Huang, **Y.-J. Hwang**, H. Jiang, M. Kesteven, D. Y. Kubo, C. T. Li, P. Martin-Cocher, P. Oshiro, P. Raffin, T. Wei, W. Wilson, "AMiBA: Sunyaev-Zeldovich Effect Derived Properties and Scaling Relation of Massive Galaxy Clusters," *Astrophysical Journal*, vol. 713, no. 1, pp. 584-591, Apr. 2010.
 21. C.-W. L. Huang, J.-H. P. Wu, P.-T. P. Ho, P. M. Koch, Y.-W. Liao, K.-Y. Lin, G.-C. Liu, S. M. Molnar, H. Nishioka, K. Umetsu, F.-C. Wang, P. Altamirano, M.

- Birkinshaw, C.-H. Chang, S.-H. Chang, S.-W. Chang, M.-T. Chen, T. Chiueh, C.-C. Han, Y.-D. Huang, **Y.-J. Hwang**, H. Jiang, M. Kesteven, D. Kubo, C.-T. Li, P. Martin-Cocher, P. Oshiro, P. Raffin, T. Wei, and W. Wilson, "AMiBA: scaling relations between the integrated Compton- γ and X-ray derived temperature, mass, and luminosity," *Astrophysical Journal*, vol. 716, no. 1, pp. 758-765, June 2010.
22. C.-T. Li, D. Y. Kubo, W. Wilson, K.-Y. Lin, M.-T. Chen, P. T.-P. Ho, C.-C. Chen, C.-C. Han, P. Oshiro, P. Martin-Cocher, C.-H. Chang, S.-H. Chang, P. Altamirano, H. Jiang, T.-D. Chiueh, C.-H. Lien, H. Wang, R.-M. Wei, C.-H. Yang, J. B. Peterson, S.-W. Chang, Y.-D. Huang, **Y.-J. Hwang**, M. Kesteven, P. Koch, G.-C. Liu, H. Nishioka, K. Umetsu, T. Wei, and J.-H. P. Wu, "AMiBA Wideband Analog Correlator," *Astrophysical Journal*, vol. 716, no. 1, pp. 746-757, June 2010.
23. G.-C. Liu, M. Birkinshaw, J.-H. Wu, P. Ho, C.-W. Huang, Y.-W. Liao, K.-Y. Lin, S. Molnar, H. Nishioka, P. Koch, K. Umetsu, F.-C. Wang, P. Altamirano, C.-H. Chang, S.-H. Chang, S.-W. Chang, M.-T. Chen, C.-C. Han, Y.-D. Huang, **Y.-J. Hwang**, H. Jiang, M. Kesteven, D. Kubo, C.-T. Li, P. Martin-Cocher, P. Oshiro, P. Raffin, T. Wei, and W. Wilson, "Contamination of the Central Sunyaev-Zel'Dovich Decrements in AMiBA Galaxy Cluster Observations," *Astrophysical Journal*, vol. 720, no. 1, pp. 608-613, Aug. 2010.
24. J.-T. Lu, Y.-C. Hsueh, Y.-R. Huang, **Y.-J. Hwang**, and C.-K. Sun, "Bending loss of terahertz pipe waveguides," *Optics Express*, vol. 18, no. 25, pp. 26332-26338, Dec. 2010.
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