

Biographical Summary: Albert Chin

Current Status

- . Distinguished Professor, Electronics Eng. Dept., National Chiao Tung University, Hsinchu, Taiwan
<http://eds.ieee.org/technical-committees/eds-compound-semiconductor-devices-and-circuits-technical-committee.html>

Education

- . Ph.D., M.S., University of Michigan, Ann Arbor, USA, 1989, 1986, Electrical Engineering (Advisor: Professor Pallab K. Bhattacharya, National Academy of Engineering Fellow, USA)
- . B.S., National Tsing Hua University, 1982, Electrical Engineering

Expertise

High- κ CMOS, Flash Memory, RF Si devices/IC, Opto-electronics, Thin-Film devices, GaN MOSFET

Industry & Academia Experiences

- . Consultant at IC fabs (CTO office-TSMC, 2003~2004; Senior Director TSMC, 2005~2006)
- . Consultant at Solar Cells company, Hsinchu Taiwan, 2006~2007
- . RF IC Design House co-founder, 2000
- . Texas Instruments-Dallas USA, 1996-1997, Visiting Scientist
- . General Electric Electronics Lab., 1990-1992, Senior Engineer, RF III-V HEMT
- . AT&T Bell Labs., 1989-1990, Post-Doc MTS, Opto-electronics
- . National Univ. of Singapore, EE Dept. & SNDL, 2002~2003 summer, 2004~2005, Visiting Professor
- . National Chiao Tung Univ. (NCTU), Associate Professor, 1992~1996; Professor, 1997~
- . Deputy Director of Multi-Disciplinary Research Center; Vice CEO of Diamond Project, NCTU, 2010

Editorial & EDS Committee Services

- . *Member*, Conference Meetings Committee, *IEEE JEDS*, 2016~
- . *Vice Chair*, *IEEE EDS* Subcommittee for Regions/Chapters Region 10, 2015~
- . *Editor*, *IEEE Electron Devices Letters* 2012~
- . *Chair*, Compound Semiconductor Devices & Circuits Technical Committee, *IEEE ED Society*, 2016~
- . *Chair*, Electronic Materials Technical Committee, *IEEE ED Society*, 2014~2015
- . *Guest Editor & Editor-in-Chief*, Special Issue on “Advanced Technology for Ultra-Low Power Electronic Devices”, *IEEE JEDS*, 2016

Conference Services

- . Intl. Advisory Committee, *IEEE Electron Devices Tech. & Manufacturing Conf.* (EDTM), 2017
- . *IEEE IEDM* Executive Committee, Asian Arrangements Co-Chair, 2009~2010
- . *IEEE IEDM* Sub-Committee Chair, 2008
- . *IEEE IEDM* Technical Committee Member & section chair, 2006~2007
- . Rump section panelist, *62th Device Research Conference* (DRC), 2004
- . Panelist, New Channel Materials for Future MOSFET Technology Workshop (SEMATECH), 2005
- . Panelist, Silicon Nanoelectronics Workshop (SNW), 2011
- . Panelist, *IEEE International Conf. on Solid-State & IC Technology* (ICSICT), 2012
- . Tutorial, *Materials Research Society (MRS)*, 2010
- . Organizer, *ElectroChemical Society (ECS)*, 2005
- . General Chair, *Energy, Materials & Nanotechnology (EMN)* Open Access Week, 2014
- . Keynote Speaker, Annual World Congress of Nano Science & Technology (Nano S&T), 2015, 2017

Chapter Services

- . Vice Chair, *IEEE EDS* Region 10 Subcommittee for Regions/Chapters, 2015~
- . Member, *IEEE ED Society* Meetings Committee, 2016~
- . *IEEE EDS* Distinguished Lecturer, 2009~

- . Vice President, Asia-Pacific Academy of Materials Taiwan Section, 2013~

Seminar & Conference Talk Services

- . Seminar in major IC companies: IBM, Sept. 2013, Oct. 2011; SanDisk, May 2011; Toshiba, Feb. 2011; TI, Sept. 2009; Samsung, Nov. 2013, Nov. 2009 (EVP), Dec. 2003; TSMC, UMC, SMIC etc.
- . Seminar in major Universities: Stanford, Berkeley, UIUC, UC-San Diego, U. of Michigan, U. of Florida, Tokyo Inst. of Tech., U. of Tokyo, Tohoku Univ., Seoul National Univ., Peking Univ., Tsing Hua Univ., Fudan Univ., National Univ. of Singapore, etc.
- . Invited talk in major semiconductor conferences:
IEDM, European Solid State Device Research Conf. (*ESSDERC*), European Materials Research Society (*E-MRS*), Materials Research Society (*MRS*), Ge Technology Workshop (IMEC), 16th Insulating Films on Semiconductors (*INFOS*) Cambridge UK, Intl. Solid-State Devices & Materials Conf. (*SSDM*), Intl Conf. on Materials for Advanced Technologies (*ICMAT*), Intl. Symp. Advanced Gate Stack Tech. (*ISAGST*), 3D Transistor Workshop (Director Yoshiro Nishi, Stanford Univ.), ElectroChemical Society (*ECS*), Electron Devices & Solid-State Circuit (*EDSSC*), etc.

Society Fellow

- . *IEEE* Fellow 2011 (for contribution to high- κ dielectric and metal gate electrodes for CMOS)
- . *OSA* Fellow 2013 (for contribution to resonantly enhanced photodiodes, sub-ps photo-response applications, and display devices)
- . *Asia-Pacific Academy of Materials* Academician 2013

Research Field & Contribution (Ultra-low-power & Energy-Efficient Green Electronic Devices)

- . Pioneering low DC-power high- κ gate dielectric MOSFET used for CMOS manufacturing (*Symp. on VLSI* 1999, 2000, 2003, 2004, 2006, 2008; *IEDM* 2004, 2005, 2006, 2007, 2010).
- . Pioneering planar high- κ Flash memory and used for 128 GB memory array production (*Symp. on VLSI* 2005, 2006; *IEDM* 2005, 2006, 2008, 2010).
- . Invented low AC-power high-mobility Ge-On-Insulator (GeOI) CMOS (*Symp. on VLSI* 2003; *IEDM* 2003, 2004, 2010; cited by *Intl. Tech. Roadmap for Semiconductors (ITRS)*).
- . Pioneering low-power Steep Turn-On CMOS ($SS < 60 \text{ mV/dec}$) & 1-Transistor ferro DRAM (*EDL* 2014 & *TECHNICAL BRIEFS*, "Green Electronic Devices-Recent Trends," *IEEE Electron Device Society Newsletter*, vol. 21, no. 3, 2014. (published quarterly) eds.ieee.org/eds-newsletters.html).
- . High-mobility, wide-energy-bandgap material MOSFET to lower quantum-mechanical direct tunneling leakage in Si FinFET and useful for brain-mimicking 3D IC (*IEDM* 2015 & www.semiconductor-today.com/news_items/2011/DEC/NCTU_201211.html).
- . Low power high- κ display TFT & Flexible Electronics (*IEDM* 2015, *Adv. Materials* 2011, Impact Factor=18.96).
- . Invented the III-V resonant cavity photo-detector with high gain-bandwidth product (*IEEE JVT*, 1992).

Citation & Report

- . Co-authored 7 "Highly Cited Papers" (top 1% in Engineering worldwide, ISI Web of Knowledge SM)
- . Worldwide Citation Ranking in Engineering 2010: #400 (ISI Web of Knowledge SM)
- . Reported by "The New York Times"
bits.blogs.nytimes.com/2008/12/15/for-chip-makers-hybrids-may-be-a-way-forward/

Publication

- . 251 Journal papers: 113 *IEEE* papers & 54 papers in APL, JAP, PR.
- . 240 Conference papers: 24 papers in *IEDM*, 16 in *Symp. on VLSI Tech.* & 17 in *Intl. Microwave Symp.*
- . 3 Book Chapters published by American Scientific Publishers (ASP), 2009, INTECH Publisher, April 2010 (>8000 downloads), and Wiley-VCH publishers, 2012.