Professeur BAILLARGEAT Dominique
Classe Exceptionnelle
dominique.baillargeat@xlim.fr
49 years old , French
Married, 2 childrens

IEEE member, TC25 member

A. EDUCATIONAL QUALIFICATIONS

- 1995 Doctor of University of Limoges (France),
  with highest honors in Optical and Microwaves Communications

B. PROFESSIONAL EXPERIENCE

- 2013- present : **Director CNRS of XLIM** UMR 7252 CNRS/University of Limoges , France
- 2014-present : **Director of Lab of Excellence : SIGMA_LIM**

- 2009 –2013: 1st **Director CNRS of CINTRA** UMI CNRS/NTU/THALES 3288, Singapore
- 2009–2013: **Adjunct Professor** at the School of EEE-NTU, Singapore (full time in Singapore since September 2009 to September 2013)
- 2005- present: **Full Professor** at XLIM UMR 7252 CNRS/University of Limoges , France

XLIM :

- XLIM is a joint laboratory between CNRS and University of Limoges.
- XLIM has an expertise **i**n the domain of electronics and microwaves, optics and photonics, CAD, mathematics, computer sciences and image processing for the application in secured environments, biotechnology and health, energy control and saving.
- XLIM incorporates more than 480 people among professors, CNRS researchers, engineers, technicians, post-doctoral researchers, PhD students and administrative staff
- The consolidated budget is about 20 M€/year.

Lab of Excellence SIGMA_LIM :

- The call for projects launched in 2010 by the Government on the future investment programs aims to select laboratories of excellence and to enable them to be at the level of excellence of foreign laboratories.
- Sigma_Lim is investigating new materials and processes for the design, **the integration** and fabrication of future integrated, secured and smart communicating components and systems.
- The total budget is about 8 M€ for a 8 years duration

CINTRA :

- I was the first director, in charge of building the research lab.
- CINTRA is a joint laboratory between Nanyang Technological University (NTU), the National Center of Scientific Research (Centre National de la Recherche Scientifique or CNRS), the largest governmental research organization in France, and Thales, the French electronics giant and a global technology leader in aerospace, space, defense, security and transportation industries.
- CINTRA is physically located at NTU's Research Techno Plaza, in Singapore, and currently has about 50 associates.
- The consolidated budget is about 3 Ms$/year.
- The vision of CINTRA is to develop nanotechnologies for electronics and photonics

- **Reviewer** for IEEE Microwave Theory and Techniques, IEEE Microwave and Wireless Components Letters, RFMICAE, IET Proceedings on Microwaves, Antennas and Propagation, TPC member of Int. Microwave Symp.

- **Expert** DGA (Defense), ANR (Research), DGRI (Research-Education)

- **Other Administrative responsibilities**
  - June 2008-Aug 2009: Director of the PhD doctoral school of the University of Limoges
  - 2007-2009: Member of the Management Board of the Science and Technical Faculty of Limoges
  - 2004-2005, 2009: Member of the Scientific Board of the University of Limoges
  - 2013-present: Member of the Management Board of the University of Limoges

C. RESEARCH INTERESTS & PUBLICATIONS

- My research activities are focused on (1) EM modelling and design of RF components and modules, (2) on nano-modelling and nanocharacterization techniques for assisting the development of carbon based devices (solutions for RF nanopackaging (interconnect), RF components such as nano-resonators, nano antennas, etc.) used in high-frequency electronics.
- 4 Book chapters, 50 International reviews, 160 International conference papers with peer review.

D. PREVIOUS AND CURRENT RESEARCH GRANTS

- XLIM consolidated budget : 20 M€/year
- Lab Of Excellence SIGMA_LIM : 7.5 M€ for 8 years
- CINTRA consolidated budget : 3Ms$/year
- Since 1995 , 25 External Projects as PI or co-PI

E. LIST OF RECENT COLLABORATORS

- **With industrials:** Thales Alenia Space, UMS, THALES, ST Microelectronics, EADS
- **Under National grants: CNES** (French Space Agency), **CNRS, DGA** (French Army), **French research ministry (12 programs:** Telecom programs, MENESR programs, ANR – National Research Agency - programs)
- **International grants and relations:**
- **European programs:** PIDEA, CELTIC, ESA,
- **VTT (LTCC manufacturer from Finland)**
- **Carleton University (Canada, Prof L Roy):** co-supervisor of one PhD student (FCCR program),
- **Purdue University (USA):** Prof Bill Chappel
- **Nanyang Technological University, Singapore :** Prof Tay Bang Kang, Prof Zhang Qing

G. LIST OF ADVISEES (including student mentored)

- **Supervisor or Co-Supervisor** with Prof. S. VERDEYME and Dr S. BILA of the thesis of:
  - 30 students who are now doctors from the University of Limoges
  - 2 student who will become doctors in the next three years (in progress)
- **Co-supervisor** with Prof. TAY Beng Kang (NTU Singapore) of the thesis of:
  2 PhD students working at CINTRA lab
  Pierre Franck, CNRS-PhD scholarship: graduated in dec 2013
  Tan Dunlin, IPP scholarship, registered at NTU : graduated in may 2016

H. TEACHING

- Around 150 h / year in front of the students.
- In charge of courses on “Maxwell equations”, “Wave and propagation”, “Guided wave”, “Design of passive RF devices (filters and antenna) and integration”, for undergraduate and master students.

I. LAST PAPERS in the field of RF Nanotechnology

Other papers are related to EM simulation and design of RF passive devices and packaging

of RF devices

IMS 2015 Workshop organizer on " WSH: Nanopackaging: Multifunctional nanomaterials and devices towards 3D system miniaturization"

IMS 2016 Workshop Invited talk "WFB": Advanced Millimeter-Wave 3D/Multilayer MCM/SoP and Printing Technologies

1 Book chapter published in 2015

- book title: Advances in Atom and Single Molecule Machines, Xaivier Baillin et al. (Eds): Nanopackaging: From Nanomaterials to the Atomic Scale, 978-3-319-21193-0, 322225_1_En, (9)
- book chapter : **Designing Carbon Nanotubes Interconnects for Radio Frequency Applications,** Author: C Brun, D Baillargeat et al.

1 Book chapter to be published in 2016

- book title: Carbon Nanotube Interconnects: Process, Design and Applications, Edited by A. Todri-Sanial, J. Dijon and A. Maffucci, Springer, 2016, ISBN: 978-3-319-29746-0
- book chapter : "**Carbon Nanotubes for Interconnects",** Author: D Baillargeat – BK Tay

REVIEW PAPERS

Chong Yap Chin; Tan Dunlin; Brun Christophe; Li Hong; Hang Tong Teo Edwin; Baillargeat Dominique; Kang Tay Beng *« Impact of the CNT growth process on gold metallization dedicated to RF interconnect applications »***,** International journal of microwave and wireless technologies, 2010, Vol., n°, pp.463-469

Li Hong; Zhang Qing; Chong Chin; Yap Ray; Kang Tay Beng; Hang Tong Edwin Teo; Olivier Aurelien; Baillargeat Dominique *« From bulk to monolayer MoS2: evolution of Raman scattering »***,** Advanced Functional Materials, 2012, Vol., n°, pp.1385-1390

Diesinger H.; Panahandeh-Fard M.; Wang Z.; Baillargeat Dominique; Soci C. *« Enhancing photocurrent transient spectroscopy by electromagnetic modeling »* Review of Scientific Instruments, 2012, Vol., n°, pp.053103-053103-6

Franck Pierre; Baillargeat Dominique; Tay Bk *« Mesoscopic Model for the Electromagnetic Properties of Arrays of Nanotubes and Nanowires: a Bulk Equivalent Approach. »***,** Nanotechnology, IEEE Transactions on, 2012, Vol., n°, pp.964 - 974

Brun Christophe; Chong Yap Chin; Li Hong; Tan Dunlin; Baillargeat Dominique; Tay Beng Kang; Edwin Hang Tong Teo *« Carbon nanotube bumps for the flip chip packaging system »***,** Nanoscale Research Letters, 2012, Vol.7, n°105, pp.1-8

Samani Mk; Khosravian N.; Chen Gck; Shakerzadeh M.; Baillargeat Dominique; Tay Bk *« Thermal conductivity of individual multiwalled carbon nanotubes »***,** International Journal of Thermal Sciences, 2012, Vol., n°, pp.40-43

Franck Pierre; Baillargeat Dominique; Tay Beng Kang *« Carbon-nanotube-based electrically-short resonant antennas »***,** International journal of microwave and wireless technologies, 2013, Vol., n°, pp.1-6

Khosravian N.; Samani Mk; Loh Gc; Chen Gck; Baillargeat Dominique; Tay Bk *« Molecular dynamic simulation of diamond/silicon interfacial thermal conductance »***,** Journal of Applied Physics, 2013, Vol., n°pp.024907-024907-4

Loh Gc; Baillargeat Dominique *« Thermal transport in C 20 fullerene-chained carbon nanobuds »***,** Journal of Applied Physics, 2013, Vol., n°, pp.123504-123504-8

Brun Christophe; Chong Yap Chin; Pacchini S.; Tan Dunlin; Tay Bk; Baillargeat Dominique; Bila Stéphane *« Flip Chip Based on Carbon Nanotube-Carbon Nanotube Interconnected Bumps for High-Frequency Applications »,* IEEE Transactions on Nanotechnology, 2013, Vol.12, n°4, pp.609-615

Loh Gc; Baillargeat Dominique *« Graphitization of amorphous carbon and its transformation pathways »* Journal of Applied Physics, 2013, Vol., n°, pp.33534

Loh Gc; Baillargeat Dominique *« Thermal transport in boron nitride nanotorus--towards a nanoscopic thermal shield »***, J**ournal of Applied Physics, 2013, Vol.114, n°, pp.183502

Khosravian N.; Samani Mk; Loh Gc; Chen Gck; Baillargeat Dominique; Tay Bk *« Effects of a grain boundary loop on the*

thermal conductivity of graphene: A molecular dynamics study », Computational Materials Sciencee, 2013, Vol.79, n°, pp.132-135

C. Brun, *et al.*, " Carbon nanostructures dedicated to Millimeter-wave to THz Interconnects" *Terahertz Science and Technology, IEEE Transactions 2015, June 2015*

Dunlin Tan, Jong Jen Yu, David Hee, Hock Siong Lim, Dominique Baillargeat, Philippe Eudeline, and Beng Kang Tay "Improved RF isolation using carbon nanotube fence-wall for 3D integrated circuits and packages" IEEE Microwave and Wireless Components Letters - Accepted for publication

CONFERENCES PAPERS

Tan D.; Yap Cc; Li Xc; Wei J.; Baillargeat Dominique; Tay Bk *« Understanding the electrical transport properties of carbon nanotubes and its metal under-layers »*, Electronics Packaging Technology Conference (EPTC), 2011 IEEE 13th, Singapour, 2011-12-07, pp.104-107

Khosravian N.; Samani Mk; Loh Gc; Shakerzadeh M.; Baillargeat Dominique; Kang Tay Beng
« Study on thermal boundary conductance between diamond and amorphous carbon », Electronics Packaging Technology Conference (EPTC), 2011 IEEE 13th, Singapour, 2011-12-07, pp.839-840

Li Xiaocheng; Guan Chee Jarvis Loh; Liang Kun; Baillargeat Dominique; Kang Tay Beng
« Heat conduction across multiwalled carbon nanotube/graphene hybrid films », Electronics Packaging Technology Conference (EPTC), 2011 IEEE 13th, Singapour, 2011-12-07, pp.63-66

Brun Christophe; Franck Pierre; Yap Chin Chong; Tan Dunlin; Teo Edwin Hang Tong; Bila Stéphane; Baillargeat Dominique *« Hybrid EM/circuit modeling for carbon nanotubes based interconnects »*, 13th Electronics Packaging Technology Conference, EPTC 2011, Singapour, 2011-12-08, Session B-2

Brun Christophe; Yap Chin Chong; Tan Dunlin; Teo Edwin Hang Tong; Bila Stéphane; Verdeyme Serge; Baillargeat Dominique; Tay Beng Kang *« Study of carbon nanotube flip-chip methodology for interconnect technology bia electromagnetic and circuit model approach »*, Microwave Symposium Digest (MTT), 2011 IEEE MTT-S International, Baltimore, États-Unis, 2011-06-05, pp.1-4

Franck Pierre; Brun Christophe; Yap Chin Chong; Tan Dunlin; Teo Edwin Hang Tong; Bila Stéphane; Baillargeat Dominique; Tay Beng Kang *« Plasmon resonances of carbon-nanotube-based dipole antennas for nano-interconnects »*, Electronics Packaging Technology Conference (EPTC), 2011 IEEE 13th, Singapour, 2011-12-07, pp.167-170

Yap Chin Chong; Tan D.; Brun Christophe; Franck Pierre; Li H.; Teo Edwin Hang Tong; Baillargeat Dominique; Tay Beng Kang, *« Carbon Based Nanotechnologies Dedicated to High Frequency Applications »*, IEEE 4th International Nanoelectronics Conference (INEC), 2011, Chang Gung, Taïwan, 2011-06-21

Yap Chin Chong; Brun Christophe; Tan Dunlin; Teo Edwin Hang Tong; Wei Jun; Baillargeat Dominique; Tay Beng Kang, *« Characterization of novel CNT to »*, 13th Electronics Packaging Technology Conference, EPTC 2011, Singapore, Singapour, 2011-12-08, Session B4.5 / P0195

Brun Christophe; Chong Yap Ching; Kang Tay Beng; Baillargeat Dominique; D Tan, *« Electrical Properties of Flip Chip Bonding Using Carbon Nanotube Bundles for Rf Applications »*, International Conference of Young Researchers on Advanced Materials (ICYRAM), Singapour, 2012-06-01

Franck Pierre; Baillargeat Dominique; Tay Bk, *« Performance assessment of optimized carbon-nanotube-based wireless on-chip communication »*, SPIE NanoScience+ Engineering, France, 2012-09-27, pp.84620B-84620B-11

Franck Pierre; Baillargeat Dominique; Tay Bk, *« Trade-offs in designing antennas from bundled carbon nanotubes »*, Microwave Symposium Digest (MTT), 2012 IEEE MTT-S International, États-Unis, 2012-06-17, pp.1-3

Chow Wl; Yap Cc; Tan D.; Shakerzadeh M.; Samani Mk; Brun Christophe; Teo Eht; Baillargeat Dominique; Tay Bk, *« Carbon based multi-functional materials towards 3D system integration. Application to thermal and interconnect management »*, Microwave Symposium Digest (MTT), 2012 IEEE MTT-S International, France, 2012-06-17, pp.1-3

Franck Pierre; Baillargeat Dominique; Tay Bk, *« Designing carbon-nanotube-based millimeter to sub-millimeter antennas »*, IEEE International Topical Symposium on RF Nanotechnology, Singapour, 2012-05-22, pp.1-4

Franck Pierre; Baillargeat Dominique; Tay Beng Kang, *« Parametric Study of Realistic Carbon-nanotube-based Electrically-short Resonant Antennas »*, Proceeding of International Conference of Young Researchers on Advanced Materials, IUMRS-ICYRAM 2012, Singapore, 2012-07-01

Franck Pierre; Baillargeat Dominique; Tay Beng Kang, *« Performance assessment of optimized carbon-nanotube-based*

wireless on-chip communication », Proceedings of SPIE - the international society for optical engineering, France, 2012-08-12, pp.V 84620B

Franck Pierre; Wang Z.; Baillargeat Dominique; Soci Césare; Tay Beng Kang, *« Photocurrent Study of Locally Grown and Solution-deposited Carbon Nanotubes »*, Proceedings of International Conference on Materials for Advanced Technologies, MRS, ICMAT 2013, Singapour, Singapour, 2013-06-30, ICMAT13-A-2309.

Franck Pierre; Baillargeat Dominique; Tay Beng Kang
« Design and assessment of carbon-nanotube-based remote links to nanodevices »
Microwave Symposium Digest (IMS), 2013 IEEE MTT-S International, Seattle, États-Unis, 2013-06-02, pp.1-3

Franck Pierre; Brun Christophe; Chow Waileong; Xiang Lu Cong; Tan Dunlin; Li Hong; Baillargeat Dominique; Kang Tay Beng, *« Applications of a Mesoscopic Electromagnetic Model for Carbon Nanotubes Arrays »*
International Conference on Material for Advanced Technologies, ICMAT 2013, Singapour, 2013-06-30

Pacchini Sébastien; Paragua Macuri Carlos Alberto; Frigui Kamel; Flahaut Emmanuel; Bila Stéphane; Baillargeat Dominique; Beng Kang Tay, *« CNT's Inks Based RF Resonator on Paper »*, 7th International Conference on Materials for Advanced Technologies (ICMAT), Singapour, 2013-06-30

Pacchini Sebastien; Frigui Kamel; Paragua-Macuri Carlos; Flahaut Emmanuel; Bila Stéphane; Tay Beng Kang; Baillargeat Dominique, *« CNTs effects on RF resonator printed on paper »*, IEEE MTT-S International Microwave Symposium (IMS 2013), Seattle, États-Unis, 2013-06

Brun Christophe; Franck Pierre; Coquet Philippe; Baillargeat Dominique; Tay B.K., *« Horizontal and vertical carbon-nanotube-array-based antenna designs »*, European Microwave Week 2013 Nuremberg, Nuremberg, Allemagne, 2013-10-06

Chong Yap Chin; Tan Dunlin; Brun Christophe; Wei Jun; Hang Tong Teo Edwin; Baillargeat Dominique; Kang Tay Beng, *« Improving the Performance of CNT to CNT Bumps for Flip Chip Applications »*, International Conference on Material for Advanced Technologies, ICMAT 2013, Singapour, 2013-06-30

Brun Christophe; Franck Pierre; Coquet Philippe; Baillargeat Dominique; Kang Tay Beng, *« Monopole antenna based on carbon nanotubes »*, Microwave Symposium Digest (MTT), EEE MTT-S International, Seattle, USA, 2013, États-Unis, 2013-06-02

Brun Christophe; Chong Yap Ching; Coquet Philippe; Baillargeat Dominique; Kang Tay Beng, *« Measurement and Modeling of Carbon Nanotubes-based Flip-Chip RF Device »*, Microwave Symposium Digest (MTT), EEE MTT-S International, Seattle, USA, 2013, États-Unis, 2013-06-02

Tan Dunlin; Chong Yap Chin; Hee David; Yu Jongjen; Reverchon Jean-Luc; Bois Philippe; Baillargeat Dominique; Kang Tay Beng, *« Carbon nanotube array as high impedance interconnects for sensing device integration »*, Electronic Components and Technology Conference (ECTC), 2013 IEEE 63rd, États-Unis, 2013-05-28, pp. 154-158

Franck Pierre; Yap Cc; Brun Christophe; Pacchini S.; Chow Wl; Li H.; Baillargeat Dominique; Tay Bk
« Carbon-nanotube-based RF components with multiple applications », Wireless Symposium (IWS), 2013 IEEE International, Chine, 2013-04-04, pp.1-4

Pacchini Sebastien; Frigui Kamel; Bila Stéphane; Flahaut Emmanuel; Coquet Philippe; Baillargeat Dominique, *« Impact of CNT-film printed on conformal resonator on paper »*, IEEE MTT-S International Microwave Symposium Digest, Tampa Bay, États-Unis, 2014