

Thang Bach Phan, Assoc. Prof. PhD
Senior Lecturer, Director



¹ Center for Innovative Materials and Architectures, Vietnam National University,
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² Department of Thin Films and Nanomaterial, Faculty of Materials Science and
Technology, University of Science, Vietnam National University, Ho Chi Minh City

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Education

Ph.D, Electronic Materials

Sungkyunkwan University, South Korea

BSc, Applied Physics

University of Science, Ho Chi Minh City, VietNam

Experience

Lecturer

2001 - 2004

Faculty of Physics, University of Science, Ho Chi Minh City, VietNam

PhD student

2004 - 2009

School of Advanced Materials Science & Engineering, Sungkyunkwan University, South Korea

Lecturer

11/2009 - 8/2016

Senior Lecturer

8/2016 - present

Depute Head - Department of Thin Film Materials & Devices, Faculty of
Materials Science, University of Science, Ho Chi Minh City, VietNam.

7/2009 - 2/2012

Deputy Head - Laboratory of Advanced Materials, University of Science,
Ho Chi Minh City, VietNam

7/2010 - present

Head - Department of Nano and Thin film Materials, Faculty of Materials Science, University of Science, Ho Chi Minh City, VietNam **2/2012 - present**

Vice Dean - Faculty of Materials Science, University of Science, Ho Chi Minh City, VietNam **2/2012 - 12/2016**

Director - Center for Innovative Materials and Architectures, Vietnam National University, Ho Chi Minh City **1/2017 - present**

Teaching

Undergraduate courses:

Fundamental of Materials Science; Magnetic Materials and Superconducting; Physics Properties of Semiconductor; Defect chemistry of metal oxides

Faculty of Materials Science, University of Science - Vietnam National University in HoChiMinh city, Vietnam (VNU-HCM).

Visiting lecturer

General Physics 1, 2 (Taught in English)

Advanced Education Program in Information System, University of Informatic Technology – Vietnam National University in HoChiMinh city, Vietnam (VNU-HCM).

Visiting lecturer

Physics of Interface and Surface; Thin Film Processes; Electronic devices (Taught in English)

Materials Science and Nanotechnology Program, University of Science and Technology of Hanoi (**France – Vietnam University**)

Graduate courses:

Materials Characterization Techniques

Faculty of Materials Science, University of Science - Vietnam National University in HoChiMinh city, Vietnam (VNU-HCM).

Visiting lecturer

Micro – Nano Devices and Systems

Master Degree Program of Nano Materials and Devices, Laboratory for Nanotechnology (LNT), Vietnam National University in Ho Chi Minh

Visiting lecturer

Defect Chemistry of Metal Oxides; Physical Properties of Semiconductor devices

Faculty of Physics and Engineering Physics, University of Science - Vietnam National University in HoChiMinh city, Vietnam (VNU-HCM).

Current Research

1. Thermoelectric thin films materials
2. Thin film process and properties of nanolaminate oxide for oxide electronics.
3. Physical properties and mechanisms of multifunctional artificial oxide system for emerging non volatile semiconductor memories (ReRAM)
4. Memristive Biosensor
5. Magnetic materials

Research projects

1. Electrical conduction and resistance switching mechanisms of nanostructural Cr-doped SrTiO₃ and ZnO, TiO₂ thin films applied in Electronic Memory Device, *Principal investigator*, The National Foundation for Science and Technology Development – Vietnam (NAFOSTED), 2010-2012.
2. Studying on ZnO Oxide Thin Films applied in Memory Devices, *Principal investigator*, Vietnam National University in HoChiMinh City, 2011.
3. Investigating Electrical conduction and reversible resistance switching mechanisms of Transition Metal Oxides WO_x for fabricating Random Access Memory, *Principal investigator*, Vietnam National University in HoChiMinh City (Key project VNU-B), 2013-2015.
4. Electrical conduction and resistance switching mechanisms of Chromium oxide thin film, *Principal investigator*, The National Foundation for Science and Technology Development – Vietnam (NAFOSTED), 2013-2015.
5. Transparent conducting oxide thin films IGZO for high temperature applications, *Principal investigator*, Bilateral Research VNUHCM – JAIST (Japan), 2013.
6. Study on fabrication of Memristive –Biosensor applied in biomedical analysis, *Principal investigator*, Bilateral Research, VNUHCM – VAST, 2015-2017.
7. Investigating of effects of In and Ga co-doping on thermoelectric properties of ZnO thin films for thermoelectric applications, *Principal investigator*, The National Foundation for Science and Technology Development – Vietnam (NAFOSTED), 2016-2018.

International Publications (SCI)

1. J. Kim, **B. T. Phan**, T. Choi, and J. Lee, *Growth mode of La_{0.5}Sr_{0.5}CoO₃ Thin Films with Oxygen Pressure on Stepped SrTiO₃ Substrate*, J. Kor. Phys. Soc. **49**, S604 (2006).
2. **B. T. Phan**, T. Choi, and J. Lee, *Trap-controlled Space-Charge-Limited Current Conduction of Cr-doped SrTiO₃ Thin Films*, J. Kor. Phys. Soc. **51**, 664 (2007).

3. C. Jung, T. Choi, **B. T. Phan**, and J. Lee, *Resistive Switching and Threshold Current of Cr-doped SrTiO₃ Thin Films deposited by Pulsed Laser Deposition*, Integ. Ferro. **90**, 107 (2007).
4. **B. T. Phan**, T. Choi, and J. Lee, *Impedance Spectroscopy Study on Trap-controlled Space-Charge-Limited Conduction of Cr-doped SrTiO₃ Thin Films*, Integ. Ferro. **96**, 146 (2008).
5. **B. T. Phan** and J. Lee, *Effects of Interfacial Oxygen-deficient Layer on Resistance Switching in Cr-doped SrTiO₃ Thin Films*, Appl. Phys. Lett. **93**, 222906 (2008).
6. **B. T. Phan**, N. C. Kim, and J. Lee, *Ac conductivity Cr-doped SrTiO₃ Thin Films*, J. Kor. Phys. Soc. **54**, 873 (2009).
7. **B. T. Phan** and J. Lee, *Non-adiabtic Small Polaron Tunneling Conduction in Reduced Cr-doped SrTiO_{3-δ} Thin Films*, Appl. Phys. Lett. **94**, 232102 (2009).
8. J. W. Seo, **B. T. Phan**, J. Stahn, J. Lee, and C. Panagopoulos. *Relaxor characteristics at the interfaces of NdMnO₃/SrMnO₃/LaMnO₃ superlattices*, Phys. Rev. B. **82**, 140405 (R) (2010).
9. J. W. Seo, **B. T. Phan**, J. Lee, H. D. Kim and C. Panagopoulos. *Metallic characteristics in superlattices composed of insulators, NdMnO₃/SrMnO₃/LaMnO₃*, Appl. Phys. Lett. **98**, 171910 (2011).
10. Tran Le, Hoang Cao Son Tran, Van Hieu Le, Tuan Tran, Cao Vinh Tran, Thanh Tan Vo, Mau Chien Dang, Sang Sub Kim, Jaichan Lee, **Bach Thang Phan**, *Unipolar resistance switching characteristics in thick ZnO/Cu/ZnO multilayer*, Journal of Korean Physical Society, **60**, 7, 1087, (2012).
11. **Bach Thang Phan**, Taekjib Choi, A. Romanenko, Jaichan Lee, *Hopping and trap controlled conduction in Cr-doped SrTiO₃ thin films*, Solid-State Electronics, **75**, 43-47 (2012).
12. Kim Ngoc Pham, Trung Do Nguyen, Thi Kieu Hanh Ta, Khanh Linh Dao Thuy, Van Hieu Le, Duy Phong Pham, Cao Vinh Tran, Derrick Mott, Shinya Maenosono, Sang Sub Kim, Jaichan Lee, Duc Thang Pham and **Bach Thang Phan**, *An influence of bottom electrode material on electrical conduction and resistance switching of TiOx thin films*, Eur. Phys. J. Appl. Phys. **64**, 30102 (2013).
13. Trung Do Nguyen, Kim Ngoc Pham, Vinh cao Tran, Duy Anh Tuan Nguyen, and **Bach Thang Phan**, *Electrical Conduction and Resistance Switching Mechanisms of Ag/ZnO/Ti Structure*, Journal of Institute of Korean Electrical and Electronics Engineers, **17**,3, 229 – 233 (2013).
Hung M Le, Nam H Vu, **Bach Thang Phan**, *Migrations of Oxygen Vacancy in Tungsten Oxide (WO₃): A Density Functional Theory Study*, Computational Materials Science. **90**, 171 (2014).
14. Kim Ngoc Pham, Trung Do Nguyen, Thi Bang Tam Dao, Thi Kieu Hanh Ta, Vinh Cao Tran, Van Hieu Nguyen, Sang Sub Kim, Shinya Maenosono and **Bach Thang Phan**, *Different Directions of Switching of Chromium Oxide Thin Films*, Journal of Electronic Materials, **43**, 7, 2747-2753 (2014).
15. Duy Phong Pham, **Bach Thang Phan**, Van Dung Hoang, Huu Truong Nguyen, Thi Kieu Hanh Ta, Shinya Maenosono and Cao Vinh Tran, *Control of preferred (222) crystalline orientation of sputtered ITO thin films*, Thin Solid films, **570**, 16-19 (2014).
16. Tran Hoang Cao Son, Le Khac Top, Nguyen Thi Dong Tri, Ha Thuc Chi Nhan, Lam Quang Vinh, **Bach Thang Phan**, Sang Sub Kim, and Le Van Hieu, *Control of morphology and*

- orientation of electrochemically grown ZnO nanorods by changing deposition current density*, Metals and Materials International. Met. Mater. Int. **20**, 2, 337 (2014).
17. Thi Bang Tam Dao, Kim Ngoc Pham, Yi-Lung Cheng, Sang Sub Kim, **Bach Thang Phan**, *Correlation between crystallinity and resistive switching behavior of sputtered WO₃ thin films*, Current Applied Physics, **14**, 1707 (2014).
 18. Duy Phong Pham, Huu Truong Nguyen, **Bach Thang Phan**, Thi My Dung Cao, Van Dung Hoang, Vinh Ai Dao, Junsin Yi, and Cao Vinh Tran, *In and Ga Codoped ZnO Film as a Front Electrode for Thin Film Silicon Solar Cells*, Advances in Condensed Matter Physics, Article ID 971528 (2014).
 19. Pham Van Viet, **Bach Thang Phan**, Le Van Hieu and Cao Minh Thi, *The effect of acid treatment and reactive temperature on the formation of TiO₂ nanotubes*, Journal of Nanoscience and Nanotechnology, **15**, 5202-5206 (2015).
 20. Duy Phong Pham, Huu Truong Nguyen, **Bach Thang Phan**, Van Dung Hoang, Shinya Maenosono and Cao Vinh Tran, *Influence of addition of indium and of post-annealing on structural, electrical and optical properties of gallium-doped zinc oxide thin films deposited by direct-current magnetron sputtering*, Thin Solid Films, **583**, 201 (2015).
 21. Kim Ngoc Pham, Minsu Choi, Cao Vinh Tran, Trung Do Nguyen, Van Hieu Le, Taekjib Choi, Jaichain Lee, and **Bach Thang Phan**, *Resistive switching effect in chromium oxide thin films probed by conductive atomic force microscopy*, Journal of Electronic Materials. **44**, 10, 3395 (2015).
 22. Cao Thi My Dung, Tran Thi Nhu Hoa, Ta Thi Kieu Hanh, Tran Cao Vinh, Le Van Hieu, **Phan Bach Thang**, *Relaxor behaviour in 0.5BaTiO₃ – 0.5CoFe₂O₄ composite materials*, Journal of Magnetism, **20** (4), 353 (2015).
 23. Thi Kieu Hanh Ta, Bang Tam Thi Dao, Kim Ngoc Pham, Dai Lam Tran and **Bach Thang Phan**, *Understanding electrical conduction in WO₃ thin films applied for resistive random access memory*, Journal of Electronic Materials, **45**, 5, 2423 (2016).
 24. Kim Ngoc Pham, Van Dung Hoang, Cao Vinh Tran and **Bach Thang Phan**, *TiO₂ thin film based transparent flexible resistive switching random access memory*, Journal of Adv. Nat. Sci.: Nanosci. Nanotechnol, **7**, 015017 (2016).
 25. Ngoc Kim Pham, Kieu Hanh Thi Ta, Thi Lien Thuong Nguyen, Vinh Cao Tran, and **Bach Thang Phan**, *Surface mapping of resistive switching CrOx thin films*, Advances in Materials Physics and Chemistry, Non ISI, DOI: [10.4236/ampc.2016.63003](https://doi.org/10.4236/ampc.2016.63003), Vol 3, 3, March (2016).
 26. Thi Thanh Cao, Van Chuc Nguyen, Hai Binh Nguyen, Hung Thang Bui, Thi Thu Vu, Ngoc Hong Phan, **Bach Thang Phan**, Le Hoan, Maxime Bayle, Matthieu Paillet, Jean Louis Sauvajol, Ngoc Minh Phan and Dai Lam Tran, *Fabrication of few-layer graphene film based field effect transistor and its application for trace-detection of herbicide atrazine*, Journal of Adv. Nat. Sci.: Nanosci. Nanotechnol, **7**, 3, 035007 (2016).
 27. Thi Kieu Hanh Ta, Minh-Thuong Trinh, Nguyen Viet Long, Thi Thanh My Nguyen, Thi Lien Thuong Nguyen, Cao Vinh Tran, **Bach Thang Phan**, Derrick Mott, Shinya Maenosono, Hieu Tran-Van and Van Hieu Le, *Synthesis and Surface Functionalization of Anti-T-Cell Antibody Coupled Fe₃O₄-SiO₂-GPS-CDI Core-Shell Nanoparticles For Potential Applications in Bone*

- Marrow Transplantation*, Colloids and Surfaces A: Physicochemical and Engineering Aspects, 54, 376 (2016).
28. Meena Rittirum, Tosawat Seetawan, Sirakan Yokhasing, Korakot Matarat, **Phan Bach Thang**, Manish Kumar, Jeon Geon Han, *La/Sm/Er Cation Doping Induced Thermal Properties of SrTiO₃ Perovskite*, Inorganic chemistry, 55, 8822 (2016).
 29. Hong Nhat Nguyen Tran, Huu Truong Nguyen, Yi-ren Liu, Masoud Aminzare, Thanh Tuan Anh Pham, Cao Vinh Tran, Sunglae Cho, Deniz P. Wong, Kuei-Hsien Chen, Tosawat Seetawan and **Bach Thang Phan**, *Thermoelectric properties of Indium and Gallium dually-doped ZnO thin films*, ACS Appl. Mater. Interfaces, 8 (49), 33916–33923 (2016).
 30. Pham Van Viet, **Bach Thang Phan**, Cao Minh Thi, Le Van Hieu, *Controlled formation of Silver nanoparticles on TiO₂ nanotubes by photoreduction method*, Journal of Nanoscience and Nanotechnology, Accepted (2017).
 31. Thi Kieu Hanh Ta, Thi Nhu Hoa Tran, Quang Minh Nhat Tran, Duy Phong Pham, Kim Ngoc Pham, Thi Thanh Cao, Yong Soo Kim, Dai Lam Tran, Heongkyu Ju, and **Bach Thang Phan**, *Surface Functionalization of WO₃ Thin Films with (3-aminopropyl)triethoxysilane and Succinic anhydride*, Journal of Elec Materi, 46, 3345 (2017).
 32. Ngoc Kim Pham, Kieu Hanh Thi Ta, Vinh Cao Tran, Van Hieu Le, Bao Thu Le Nguyen, Heong Kyu Ju, Tosawat Seetawan, **Bach Thang Phan**, *Effect of Post-annealing processes on Filamentary-based resistive switching mechanism of Chromium oxide thin films*, Journal of Elec Mater, 46, 3285 (2017).
 33. **Bach Thang Phan**, Ki Tae Eom, and Jaichan Lee, *AC electrical conduction of Cr-doped SrTiO₃ thin films with oxygen deficient interface layer*, Journal of Elec Mater, 46, 3796 (2017).
 34. Yi-Lung Cheng, Chih-Yen Lee, Yao-Liang Huang, Chung-Ren Sun, Wen-Hsi Lee, Giin-Shan Chen, Jau-Shiung Fang, and **Bach Thang Phan**, *Cu-induced Dielectric Breakdown of Porous Low Dielectric Constant Film*, Journal of Elec Mater, 46, 3627 (2017).
 35. Nhu Hoa Thi Tran, Jisoo Kim, **Bach Thang Phan**, Sungwon Khym, Heongkyu Ju, *Label-free optical biochemical sensors via liquid cladding modulation of waveguide modes*, ACS Applied Materials & Interfaces, ACS Appl. Mater. Interfaces, 9, 31478 (2017).
 36. Pham Van Viet, **Bach Thang Phan**, Derrick Mott, Shinya Maenosono, Truong Tan Sang, Cao Minh Thi, Le Van Hieu, *Silver nanoparticle loaded TiO₂ nanotubes with high photocatalytic and antibacterial activity synthesized by photoreduction method*, Journal of Photochemistry and Photobiology A: Chemistry, 352, 106–112 (2018).
 37. Cao Thi Thanh, Nguyen Hai Binh, Nguyen Van Tu, Bui Van Dong, Vu Thi Thu, **Phan Bach Thang**, Matthieu Paillet, Jean Louis Sauvajol, Ngoc Minh Phan, Dai Lam Tran and Nguyen Van Chuc, *An interdigitated ISFET-type sensor based on LPCVD grown graphene for ultrasensitive detection of carbaryl*, Sensors and Actuators B: Chemical, 260, 78-85 (2018)
 38. Anh Tuan Thanh Pham, Hanh Kieu Thi Ta, Yi-ren Liu, Masoud Aminzare, Denis P. Wong, Truong Huu Nguyen, Ngoc Kim Pham, Thu Bao Nguyen Le, Tosawat Seetawan, Heongkyu Ju, Sunglae Cho, Kui-Hsien Chen, Vinh Cao Tran and **Thang Bach Phan**, *Effect of annealing temperature on thermoelectric properties of Ga and In dually doped - ZnO thin films*, Journal of Alloys and Compound, 747, 156-165 (2018).

39. Athorn Vora-ud, Manish Kumar, Su bong Jin, Pennapa Muthitamongkol, Mati Horprathum Somporn Thaowonkaew, Watchara Chao-moo, Chancana Thanachayanont , **Phan Bach Thang**, Tosawat Seetawan, and Jeon Geon Han, *Microstructural Control by Substrate Heating in Pulse-DC Sputtering Induced Thermoelectric Ge₂Sb₂Te₅ Thin Films*, Journal Alloys and Compound, (2018) Accepted.

AWARDS

- 2009** *Top 10 Young Scientist publish Good SCI paper*
Vietnam National University, HoChiMinh City (VNU-HCM).
- 2011** *Excellent Young Lecturer*
University of Science, Vietnam National University, HoChiMinh City.
- Excellent Young Lecturer*
Vietnam National University, HoChiMinh City (VNU-HCM).
- Excellent Young Lecturer*
HoChiMinh City, Vietnam.
- 2011** *Scientist has SCI Publication*
Vietnam National University, HoChiMinh City (VNU-HCM).
- 2012** *Scientist has SCI Publication*
Vietnam National University, HoChiMinh City (VNU-HCM).
- 2013** *Excellent Young Lecturer* – University of Science, Vietnam National University,
HoChiMinh City.
- Excellent Young Lecturer*
Vietnam National University, HoChiMinh City (VNU-HCM).
- Excellent Young Lecturer*
HoChiMinh City, Vietnam.
- 2014** *Scientist has SCI Publication*
Vietnam National University, HoChiMinh City (VNU-HCM).

ACADEMIC ACTIVITIES

- | | |
|---------------------------|---|
| Advisory Committee | 2017 – 2022 |
| | Science Division of Advanced Materials and Engineering
Vietnam National University, HoChiMinh city |

Editorial board member	2012 – present Journal of Institute of Korean Electrical and Electronics Engineers
	2016 – present Journal of Magnetism, SCIE journal, South Korea
Member	2001 – present Vietnam Physical Society (VPS)
	2009 – present Vietnam Materials Research Society (V-MRS)
	2017 – present Vietnam Magnetic Society <i>Vice President</i> (2017-2022)