

Research Activities

Research Achievement

My research work over the past 10+ years has spanned a broad range of metal oxide materials, with a specific focus on the **Science and Technology** of functional materials. I have built up expertise in the processing of oxides, ferroelectrics as well as thin films, and amassed several advanced materials characterization equipment as well as techniques for investigating the processing-structure-property relations. Among different properties, I am mainly focusing on optical properties.

I have made some original contributions pertaining to thin film growth by sol-gel technique as well as pulsed laser deposition, and optical characterization using ellipsometry. In 1997, I was among the first few groups to grow $\text{Sr}_{1-x}\text{Ba}_x\text{Nb}_2\text{O}_6$ (SBN) thin film using sol-gel technique. That piece of work has a relatively high ISI citation (~20) in the area of SBN films. I continued this work by introducing a new hybrid method which combined the sol-gel and PLD techniques together to grow epitaxial sol-gel thick films. Recently, I have initiated research into fabricating novel device structures using PLD method. My original demonstration came through the deposition of epitaxial PMN-PT on Si substrate using MgO/TiN buffer layer. I believe that my research performance will continue to improve, as can be reflected in both my citation and publication per year. In 1999, I only had 4 citation and 4 papers published. However, these two figures increased to 17 and 11, respectively, in 2003. Since 2001, I have been published more than 10 papers per year with many of them are in high impact journals, including, *Physics Review B*, *Applied Physics Letters* and *Journal of Applied Physics*. In the newly implemented Annual Development and Performance Review exercise, I was appraised as **Highly Satisfactory** in Research and Scholarship.

Awards

1. 李愛東，朱育平，吳迪，葉宇達，麥熾良，劉治國，閔乃本。
X-射線衍射在集成鐵電學 (鐵電薄膜) 研究中心的應用
中國分析測試協會科學技術獎 (CAIA 獎) 一等獎
中國分析測試協會. 2002.
2. LU, S.G., MAK, C.L. and WONG, K.H.
納米相鉍酸鋇超細粉末的低溫合成和尺寸效應論文
廣東省自然科學優秀學術論文評審委員會審定為2000-2001年度叁等優秀學術論文
廣東省科學技術協會。 2001.

3. LU, S.G., MAK, C.L. and WONG, K.H.
納米相鋇酸鋁超細粉末的低溫合成和尺寸效應
東莞市第二屆青年科技學術交流會優秀論文一等獎
東莞市科協，東莞團市委，東莞市婦聯及東莞市青聯。 2002
4. LU, S.G., ZHU, X.H., MAK, C.L., WONG, K.H., CHAN, H.L.W. and CHOY, C.L.
採用脈沖激光沉積法制備的具有成份梯度的外延鈦酸鋁薄膜的高電壓調諧性
東莞市第三屆青年科技學術交流會優秀論文一等獎
東莞市科學技術協會，共青團東莞市委員會及東莞市婦女聯合會。 2003.

Externally Sponsored Research Projects

Since joining PolyU, I have been successful (as principal investigator) in acquiring three Competitive Earmarked Research Grant (CERG) from the Hong Kong Research Grants Council (RGC) and one Teaching Company Scheme (TCS). I am also a co-investigator in one CERG project (2003) and in PolyU's "Nanotechnology Centre for Functional and Intelligent Textiles and Apparel" supported by ITF (HK\$14.7 M). In addition, I also have acquired over 10 internal grants from PolyU.

Grants (as Principal Investigator) obtained in **2002-2003**:

1. Structural, Dielectric and Pyroelectric Properties of Compositionally Graded (Sr,Ba)Nb₂O₆ Films. (RGC, \$440K, 2002)
2. Epitaxial (Sr,Ba) Nb₂O₆ Films for Waveguide Applications. (RGC, \$340K, 2003)
3. Development and Applications of Long Afterglow Luminescent Materials. (TCS, \$400K, 2003).