
JUNWON KIM

Research Interests

Electronic and Magnetic Properties of Strongly Correlated systems
Topological Properties in Strongly correlated systems

Educations

Ph. D. 2014 Condensed Matter Physics, POSTECH
M. D. 2006 Femtosecond Laser Physics, POSTECH
B. S. 2004 Physics, POSTECH

Career History (with Research Highlights)

Mar. 2017 - Present (Nov. 2020) Magnetic Theory Group in POSTECH
research associate

- During this first postdoctoral period, I have been focusing on the topological nature of Ce-based and Sm-based materials.

Sep. 2014 - Nov. 2016 Femtofab inc. *researcher*

- Cam design for femtosecond laser machining. (a few hundreds of micrometer scale structure making)
- Electrical circuit design and making for electric pulse generation
- Cam Design for CNC milling

Sep. 2009 - Aug. 2014 Magnetic Theory Group in POSTECH *Ph. D. student*

- The DFT and DMFT analysis of the various topological surface states, its spin texture, and Kondo behavior in a strongly correlated topological Kondo Insulator SmB_6
- Study for possible structural distortions by electron-phonon interaction and Fermi surface nesting in $(\text{La,Ce})\text{Te}_2$ based on the DFT phonon band analysis
- Exceptional behavior of CeB_4 and its origin in Lanthanides contraction of *rare-earth* tetraborides (RB_4 , $R=\text{La-Lu}$)

Sep. 2006 - Aug. 2009 Laser Plasma Laboratory in POSTECH

- Carrier Envelop Phase(CEP) Stabilization in femtosecond laser Amplifier.
- Pump-probe Magneto-Optical Kerr Effect(MOKE) experiment based on femtosecond laser pulses

Mar. 2004 - Aug. 2006 Laser Plasma Laboratory in POSTECH

- Carrier Envelop Phase(CEP) Stabilization in femtosecond laser oscillator.

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- Femtosecond laser pulse width measurement by autocorrelation skill.
 - Magneto-Optical Kerr Effect(MOKE) experiment based on femtosecond laser pulses

Teaching Experience

Fall 2005, General Physics experiments I (Undergraduate level)

Spring 2007 General Physics experiments II (Undergraduate level)

List of Publication

- Dongchoon Ryu, **Junwon Kim**, Hongchul Choi, and B. I. Min, *J. Am. Chem. Soc.* **142**, 19278-19282 (2020), "Wallpaper Dirac Fermion in a Nonsymmorphic Topological Kondo Insulator: PuB4"
 - Dongchoon Ryu, **Junwon Kim**, Kyoo Kim, Chang-Jong Kang, J. D. Denlinger, and B. I. Min, *Phys. Rev. R* **2**, 012069 (2020), "Distinct topological Properties in Ce-mononictides having Correlated f-electrons: CeN vs. CeBi"
 - **Junwon Kim**, Dongchoon Ryu, Chang-Jong Kang, Kyoo Kim, Hongchul Choi, T.-S. Nam, and B. I. Min, *Phys. Rev. B* **100**, 195138 (2019), "Topological Phase Transition in an Archetypal f-electron Correlated System: Ce"
 - Chang-Jong Kang, D.-C. Ryu, **Junwon Kim**, Kyoo Kim, J.-S. Kang, J. D. Denlinger, G. Kotliar and B. I. Min, *Phys. Rev. M* **3**, 081201(R) (2019), "Multiple topological Dirac cones in a mixed-valent Kondo semimetals: g-SmS"
 - T.-S. Nam, Chang-Jong Kang, D.-C. Ryu, **Junwon Kim**, Heejung Kim, Kyoo Kim, and B. I. Min, *Phys. Rev. B* **99**, 125115 (2019), "Topological bulk band structures of the hourglass and Dirac nodal-loop types in Ce Kondo systems: CeNiSn, CeRhAs, and CeRhSb"
 - Eunsook Lee, D. H. Kim, J. D. Denlinger, Heejung Kim, **Junwon Kim**, Kyoo Kim, B. I. Min, B. H. Min, Y. S. Kwon & J. -S. Kang *Scientific Reports* **6**, 30318 (2016), "The 7X1 Fermi Surface Reconstruction in a Two-dimensional f-electron Charge Density Wave System: PrTe3"
 - Eunsook Lee, D. H. Kim, J. D. Denlinger, **Junwon Kim**, Kyoo Kim, B. I. Min, B. H. Min, Y. S. Kwon, and J.-S. Kang, *Phys. Rev. B* **91**, 125137
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(2015) - Published 24 March 2015, "*Angle-resolved and resonant photoemission spectroscopy study of the Fermi surface reconstruction in the charge density wave systems CeTe₂ and PrTe₂*"

- **Junwon Kim**, Kyoo Kim, Chang-Jong Kang, Sooran Kim, Hong Chul Choi, J.-S. Kang, J. D. Denlinger, and B. I. Min, *Phys. Rev. B* **90**, 075131 (2014)
- Published 18 August 2014, "*Termination-dependent surface in-gap states in a potential mixed-valent topological insulator: SmB₆*"
- J.-S. Kang, D. H. Kim, H. J. Lee, Jihoon Hwang, Han-Koo Lee, H.-D. Kim, B. H. Min, K. E. Lee, Y. S. Kwon, **J. W. Kim**, Kyoo Kim, B. H. Kim, and B. I. Min, *Phys. Rev. B* **85**, 085104 (2012), "*Fermi surface reconstruction in CeTe₂ induced by charge density waves investigated via angle resolved photoemission*"
- **Junwon Kim**, Kyoo Kim, Hong Chul Choi, and B. I. Min, *Phys. Rev. B* **84**, 113108 (2011), "*Volume contraction in CeB₄ induced by delocalized Ce 4f electrons*"