SungWon Kwak

Email: kwakcosmo@gmail.com

Curriculum Vitae

Research Interests:

Computational Astrophysics, Structure Formation and Evolution, Galactic Substructure, Gas Inflow, Dwarf Galaxy, Cluster Environment, Instabilities, Dark Matter Halo, Cosmology

[Current Position]

- Military Service in the Republic of Korea
  Technical Support in Planetary Science Group
  at Korea Astronomy and Space Science Institute — 2016.09-2019.08

[Education]

- **M.S.** in Astronomy, at Seoul National University
  Thesis: Origin of Non-Axisymmetric Features of dE Galaxies in the Virgo Cluster (Advisor: Prof.Woong-Tae Kim) — 2014.09-2016.09
- **B.S.** in Astronomy
  B.S. in Physics at the University of Washington, Seattle — 2009.09-2013.12
- The Storm King High School in Cornwall on Hudson, New York — 2007.01-2009.06

[Publications]

(4) Effects of Cluster-Group Merger on Bar Formation and Star Formation Rate of Infalling Disk Galaxies

Kwak, SungWon; Kim, Woong-Tae; Quinn, Thomas R. (in prep.)

(3) Origin of Non-axisymmetric Features of Virgo Cluster Early-type Dwarf Galaxies – II. Tidal Effects on Disk Features and Stability (draft is available)

Kwak, SungWon; Kim, Woong-Tae; Rey, Soo-Chang; & Quinn, Thomas R. (to be submitted)

(2) Effects of Gas on Formation and Evolution of Stellar Bars and Gaseous Nuclear Rings in Disk Galaxies

Seo, Woo-Young; Kim, Woong-Tae; **Kwak, SungWon;** Hsieh, Pei-Ying; Han, Cheongho; & Hopkins, Phil F., ApJ, 872, 5 (2019)

(1) Origin of Non-axisymmetric Features of Virgo Cluster Early-type Dwarf Galaxies – I. Bar Formation and Recurrent Buckling

Kwak, SungWon; Kim, Woong-Tae; Rey, Soo-Chang; & Kim, Suk, ApJ, 839, 24 (2017)

[Ongoing Research]

- Origin of Blue Cores and Kinematically Decoupled Cores in Early-type Dwarf Galaxies in Galaxy Clusters

[Undergraduate Research]

- Internship at CERN, Geneva
  (University of Michigan-CERN Research Abroad Program) — 2014.01-2014.05
- SPH Simulation: Stability of Protoplanetary Disk
  with Prof.Thomas Quinn at UW-Seattle — 2013
- Finding Superimposed High Redshift Spectra Using AstroML
  with Dr.Jake Vanderplas at UW-Seattle — 2013
- ATLAS-CERN Inner Tracker Upgrade
  with Prof.Shih-Chieh Hsu at UW-Seattle — 2013
- Stellar Populations of Giant Low Surface Brightness Galaxies
  with Dr.Peter Yoachim at UW-Seattle — 2013

- Radio Astronomy
  with Prof.Woodruff Sullivan at UW-Seattle
  1) Hydrogen Distribution of the Galactic Plane 2012-2013
  2) Estimation of the Moon's Temperature
  3) Continuum Map of the Galactic Plane

[Talks / Posters] (all in English)

Poster: Formation of Bar and Spirals of Infalling Dwarf Galaxies in Clusters
Kwak, SungWon; Kim, Woong-Tae; Rey, Soo-Chang; & Quinn, Thomas
The 8th KIAS Workshop on Cosmology and Structure Formation in Nov. 2018(Seoul, Korea)

E-Poster: Are Disky Dwarf Galaxies Unstable to Formation of Bars and Spirals?
Kwak, SungWon; Kim, Woong-Tae
334th IAU Meeting 2018 (Vienna, Austria)

Talk: Bar Formation and Recurrent Buckling Instability (50min)
Kwak, Sungwon
KASI Galaxy Group Seminar in June 2017 (Daejeon, Korea)
Korean Numerical Astrophysics Meeting in Sept. 2017 (Daejeon, Korea)

Talk: Non-axisymmetric Features of Dwarf Elliptical Galaxies (15min)
Kwak, SungWon; Kim, Woong-Tae; Rey, Soo-Chang; & Kim, Suk
id:GC-24, Korean Astronomical Society Meeting 2016 (Busan, Korea)

Talk: Origin of Non-axisymmetric Features of dEs in the Virgo Cluster (15min)
Kwak, SungWon; Kim, Woong-Tae; Rey, Soo-Chang; & Kim, Suk
id:202.08, 228th AAS Meeting 2016 (San Diego, CA, USA)

Poster: Bulge Kinematics of Giant Low Surface Brightness Galaxies
Schmitz, D.; Yoachim, Peter; Loebman, S.; Debattista, V. P.; **Kwak, S.**
id:453.06, 223th AAS Meeting 2014 (Washington, D.C., USA)

Poster: IFU Observations of Giant Low Surface Brightness Galaxies
Yoachim, Peter; Schmitz, D.; Loebman, S.; Debattista, V. P.; **Kwak, S.**
id:453.05, 223th AAS Meeting 2014 (Washington, D.C., USA)

[Programming and Simulations]

- Data Analysis and Visualization using Python mainly and C++
- Smoothed Particle Hydrodynamics Simulations using ChaNGa(Charm++) & Gadget(MPI)
- Magnetohydrodynamics Simulations (MHD) using a grid-based code
- Astronomical Image Analysis using IRAF
- Engineering Modeling using Solidworks

[Observations]

- Student Radio Telescope (2.3 meter dish)
- A-Wing Observatory at the UW-Seattle (16″)
- Manastash Ridge Observatory in Washington (30″)

[Scholarships]

- Kim In-Ha Scholarship 2015-2016
- Brain Korea 21 Scholarship 2014-2016
- Erasmus Mundus Scholarship in Germany, Category A (offered) 2014-2016
- Richard Lounsbery Foundation (CERN) 2014