

SungWon Kwak

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Curriculum Vitae

Research Interests:

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

[Education]

- **Ph.D.** in Astronomy and Astrophysics
at *the University of Rome, 'La Sapienza' and 'Tor Vergata'* 2019-2022
Project: Numerical Simulations on the Chemical Evolution of
the Milky Way (Advisor: Prof. Giuseppe Bono) *(expected)*
- **M.S.** in Astronomy, at *Seoul National University*
Thesis: Origin of Non-Axisymmetric Features of dE Galaxies 2014-2016
in the Virgo Cluster (Advisor: Prof. Woong-Tae Kim)
- **B.S.** in Astronomy 2009-2014
B.S. in Physics at *the University of Washington, Seattle*
- *The Storm King High School*, New York 2007-2009

[Research Experience]

- Research Assistant at Seoul National University 2019
- Mandatory Military Service at Korea Astronomy and Space Science Institute 2016-2019
- Internship at CERN
University of Michigan-CERN Research Abroad Program 2014
- 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
- 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

[Scholarships]

- PhD Fellowship for the AASS program in Rome 2019-2022
- Kim In-Ha Scholarship 2015-2016
- Brain Korea 21 Scholarship 2014-2016
- Erasmus Mundus Scholarship for 2 years, Category A (offered) 2014-2016
- Scholarship for the CERN internship by Richard Lounsbery Foundation 2014

[Programming and Simulations]

- Data Analysis and Visualization using Python mainly and C++
- Hydrodynamics Simulations Codes: ChaNGa(Charm++) & Gadget(MPI)
- 3-D Magnetohydrodynamics Simulations using a uniform grid-based code
- Astronomical Image Analysis using IRAF
- Engineering Modeling using Solidworks

[Publications]

(5) 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.)

(4) Origin of Nonaxisymmetric Features of Virgo Cluster Early-type Dwarf Galaxies. II. Tidal Effects on Disk Features and Stability

Kwak, SungWon; Kim, Woong-Tae; Rey, Soo-Chang; & Quinn, Thomas R., ApJ, 887, 139K (2019)

(3) The Geometric Albedo of (4179) Toutatis Estimated From KMTNet DEEP-SOUTH Observation

Bach, Yoonsoo P., **et al.**, JKAS, 52, 71B (2019)

(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)

[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 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 (50mins)
Kwak, SungWon
@ Korean Numerical Astrophysics Meeting in Sept. 2017 (Daejeon, Korea)
- Talk: Non-axisymmetric Features of Dwarf Elliptical Galaxies (15mins)
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 (15mins)
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)