
Chris Wegg — CV

Laboratoire Lagrange (UMR 7293)
Observatoire de la Côte d'Azur
Boulevard de l'Observatoire
06300 Nice, France

Phone: +33 7 82 92 94 08
Email: chris.wegg@oca.eu
Website: www.chriswegg.com
Nationality: British

PUBLICATION SUMMARY:

- **Two most influential first author publications:**
 - C. Wegg, O. Gerhard, "MAPPING THE THREE-DIMENSIONAL DENSITY OF THE GALACTIC BULGE WITH VVV RED CLUMP STARS", *MNRAS*, 435, 1874 (2013). **158 Citations.**
 - C. Wegg, O. Gerhard, M. Portail, "THE STRUCTURE OF THE MILKY WAY'S BAR OUTSIDE THE BULGE", *MNRAS*, 450, 4050 (2015). **106 Citations.**
- Full list of publications attached or see orcid.org/0000-0001-6240-8771
- 863 total citations, *h*-index of 15 • 391 citations to first author papers, first author *h*-index of 8
- 286 citations normalized by author count, normalized *h*-index of 9: the majority of my papers have been impactful and influential papers together with a small number of co-authors
- **First or second author on 3 of the top 15 cited papers on the Galactic Bulge since beginning working on the Milky Way in 2013** (there have been > 500 articles in this time): my papers have not been incremental science, but significant steps
- Presented talks at 9 international conferences in the past 3 years alone, including 3 invited review talks

EDUCATION:

Caltech; PHYSICS PH.D; ADVISOR: STERL PHINNEY (2013)

- Thesis on "The dynamics of white dwarfs, black holes and stellar cusps".
- Won 2009 Caltech prize for outstanding undergraduate teaching
- Won 2008 Caltech prize for outstanding graduate teaching

University College London; PHYSICS MSCI, 1st CLASS WITH HONORS (2003)

- 1st class in every course taken
- 100% score in more than 2/3rds of courses taken
- Highest marks in Physics department every year
- Won departmental prize for best Physics student every year (4 prizes total)

RESEARCH AND WORK EXPERIENCE:

- **LABORATOIRE LAGRANGE (UMR 7293) , COTE D'AZUR OBSERVATORY, NICE**
Marie Curie Fellowship, Nov 2018 Onwards
 - Awarded a highly competitive Marie Skłodowska-Curie Individual Fellowship (€173k) from the EU. Hosted by the Galaxy and Cosmology group (group leader: Mathias Schultheis).
 - Project modelling and interpreting Gaia data together with spectroscopy on the inner Milky Way
- **DYNAMICS GROUP, MAX-PLANCK-INSTITUT FÜR EXTRATERRESTRISCHE PHYSIK**
Post-Doctoral Scholar, Sep 2012-Sep 2018
 - Utilized red clump stars as standard candles to non-parametrically measure and map the three dimensional structure of the bulge galaxy. **Paper cited >150 times in 5 years.**
 - Showed that the Milky Way has a 5kpc long bar that is naturally connected to the barred bulge of the inner Milky Way. **Paper cited >100 times in 3 years.**
 - Numerous collaborations. The most influential work *not discussed in the completed research document* has shown: (a) **Dynamical models** and **made-to-measure models** which show Andromeda has a composite bulge containing both a classical and pseudo-bulge (unlike the Milky Way which is likely entirely pseudo-bulge). (b) That the rotation rate of the bar is significantly slower than previously thought, and that **this can explain the Hercules stream of stars in the solar neighbourhood.** (c) **The most accurate measurements of the mass of Sgr A*.**

- Referee for MNRAS, A&A, ApJ and ApJL.
- **THEORETICAL ASTROPHYSICS, CALIFORNIA INSTITUTE OF TECHNOLOGY**
Teaching and Research Asst. During PhD, Oct 2003-June 2012
 - PhD work on topics in stellar dynamics, largely projects on the dynamics of stars around supermassive black holes.
 - Simulations of stellar dynamics around supermassive black holes. Wrote galactic dynamics code which demonstrated that binary supermassive black holes can be identified by the large number of tidal disruption flares.
 - Incorporated general relativity into stellar dynamics code, and showed that the rate of extreme mass ratio inspirals (EMRIs) from binary supermassive black holes is greatly enhanced.
 - PhD longer than departmental average of 6 years due to medical problems that are now resolved.
- **PELIKON, CAMBRIDGE, UK**
Electronic Engineer, 2002-2003
 - Responsible for the design and prototyping of the first electroluminescent watch from scratch. Designed and prototyped electronics, wrote embedded software.
- **CAMBRIDGE CONSULTANTS, CAMBRIDGE, UK**
Electronic Engineering, 1998-1999, Summers 2000-2002
 - Worked on numerous large projects for engineering and technology consulting firm.

SUPERVISING AND MENTORING EXPERIENCE

- Co-advised/mentored three PhD students, and two summer students, while postdoc at MPE (together with group leader Ortwin Gerhard).
- Results published in 4 second author papers with PhD student as lead author, and 8 total PhD student led papers. Together these papers have 308 citations.
- Both summer students have gone onto study for PhDs (Cornell and NYU).

ONGOING OBSERVATIONS AND EXTERNAL FUNDING

- €173k – EU2020 Marie Skłodowska-Curie Fellowship (2018)
- Survey working group (SWG) representative for the WEAVE Galactic Astronomy High Latitude Survey. Responsible for preparing, configuring and submitting observations and liaising between the survey team and other SWG members on issues such as survey footprint and scheduling.
- VVVX co-I – 4000 hours on VISTA

PRIZES

- 2009 Caltech prize for outstanding undergraduate teaching
- 2008 Caltech prize for outstanding graduate teaching
 - Winning the two university wide teaching prizes in consecutive years was unprecedented
- 2003 UCL Deans List for outstanding academic performance (awarded to top 5% graduating students)
- 2000-2003 Prize for best UCL Undergraduate Physics Student every year of degree (4 prizes total)

TEACHING

- Caltech: **Analog Electronics for Physicists** : Topics included operational amplifiers, transistors and computer data acquisition. The course culminated in a two-week project of the student's choosing.
- Caltech: **Sophomore Lab** Experiments in electromagnetic phenomena, atomic and nuclear physics.
Responsibilities: Teaching section including class recitation, supervising laboratories, grading and assigning students final grades. Sole teacher and point of contact for students.
- Teaching assistant for **Order of Magnitude Physics**, **High Energy Astrophysics** (Prof: Sterl Phinney) and **Classical Physics**, (Prof. David Politzer). Responsibilities typically holding class recitation, office hours, and grading.

List of Publications and Communications

SUMMARY

- **Two most influential first author publications:**
 - C. Wegg, O. Gerhard, “MAPPING THE THREE-DIMENSIONAL DENSITY OF THE GALACTIC BULGE WITH VVV RED CLUMP STARS”, *MNRAS*, 435, 1874 (2013). **158 Citations.**
 - C. Wegg, O. Gerhard, M. Portail, “THE STRUCTURE OF THE MILKY WAY’S BAR OUTSIDE THE BULGE”, *MNRAS*, 450, 4050 (2015). **106 Citations.**
- Full list of publications attached or see orcid.org/0000-0001-6240-8771
- 863 total citations, *h*-index of 15 • 391 citations to first author papers, first author *h*-index of 8
- 286 citations normalized by author count, normalized *h*-index of 9: the majority of my papers have been impactful and influential papers together with a small number of co-authors
- **First or second author on 3 of the top 15 cited papers on the Galactic Bulge since beginning working on the Milky Way in 2013** (there have been > 500 articles in this time): my papers have not been incremental science, but significant steps
- Presented talks at 9 international conferences in the past 3 years alone, including 3 invited review talks

RANK A PUBLICATIONS

Publications in which I have had a played a major role are marked with ⇒. I have defined this as either (i) writing the entire paper, (ii) writing significant sections of the paper, (iii) or playing a significant role in mentoring the first author and helping define the project.

HTTP links to publications are coloured [dark blue](#) or can be found at orcid.org/0000-0001-6240-8771. All rank A publications are also available on the arXiv pre-print server (follow [\[arXiv\]](#) hyperlinks).

- ⇒ 0. C. Wegg, O. Gerhard, M. Bieth, “THE GRAVITATIONAL FORCE FIELD OF THE GALAXY MEASURED FROM THE KINEMATICS OF RR LYRAE IN GAIA”, *Submitted to MNRAS*. [\[OA\]](#) **8 Citations.**
- 0. G. Monari, B. Famaey, A. Siebert, C. Wegg, O. Gerhard, “THE SIGNATURES OF THE OUTER LINDBLAD RESONANCE AND COROTATION OF A LARGE GALACTIC BAR IN LOCAL VELOCITY SPACE ”, *Submitted to MNRAS*. [\[OA\]](#) **0 Citations.**
- ⇒ 1. M. Blaña Díaz, O. Gerhard, C. Wegg *et al*, “SCULPTING ANDROMEDA – MADE-TO-MEASURE MODELS FOR M31’S BAR AND COMPOSITE BULGE: DYNAMICS, STELLAR AND DARK MATTER MASS”, *MNRAS*, 481, 3210 (2018). [\[OA\]](#) **1 Citation.**
- 2. J. Hunt, J. Bovy, A. Perez-Villegas, J. Holtzman, J. Sobeck, D. Chojnowski, F. Santana, P. Palicio, C. Wegg *et al*, “THE HERCULES STREAM AS SEEN BY APOGEE-2 SOUTH”, *MNRAS*, 474, 95 (2018). [\[OA\]](#) **15 Citations.**
- ⇒ 3. C. Wegg, O. Gerhard, M. Portail, “THE INITIAL MASS FUNCTION OF THE INNER GALAXY MEASURED FROM OGLE-III MICROLENSING TIMESCALES”, *ApJL*, 843, 5 (2017). [\[OA\]](#) **11 Citations.**
- 4. A. Perez-Villegas, M. Portail, C. Wegg, O. Gerhard, “REVISITING THE TALE OF HERCULES: HOW STARS ORBITING THE LAGRANGE POINTS VISIT THE SUN”, *ApJL*, 840, 2 (2017). [\[OA\]](#) **35 Citations.**
- ⇒ 5. M. Blaña Díaz, C. Wegg *et al*, “ANDROMEDA CHAINED TO THE BOX - DYNAMICAL MODELS FOR M31: BULGE AND BAR”, *MNRAS*, 466, 4279 (2017). [\[OA\]](#) **11 Citations.**
- ⇒ 6. M. Portail, C. Wegg, O. Gerhard, M. Ness, “CHEMODYNAMICAL MODELLING OF THE GALACTIC BULGE AND BAR”, *MNRAS*, 470, 1233 (2017). [\[OA\]](#) **20 Citations.**
- ⇒ 7. M. Portail, O. Gerhard, C. Wegg, M. Ness, “DYNAMICAL MODELLING OF THE GALACTIC BULGE AND BAR: THE MILKY WAY’S PATTERN SPEED, STELLAR AND DARK MATTER MASS DISTRIBUTION”, *MNRAS*, 465, 1621 (2017). [\[OA\]](#) **69 Citations.**

- ⇒ 8. **C. Wegg**, O. Gerhard, M. Portail, "MOA-II GALACTIC MICROLENSING CONSTRAINTS: THE INNER MILKY WAY HAS A LOW DARK MATTER FRACTION AND A NEAR MAXIMAL DISC", *MNRAS*, 463, 557 (2016). [OA] 17 Citations.
- 9. Z. Li, O. Gerhard, J. Shen, M. Portail, **C. Wegg**, "GAS DYNAMICS IN THE MILKY WAY: A LOW PATTERN SPEED MODEL", *ApJ*, 824, 13 (2016). [OA] 23 Citations.
- 10. D. M. Nataf, O. A. Gonzalez, L. Casagrande, G. Zasowski, **C. Wegg**, *et al* "INTERSTELLAR EXTINCTION CURVE VARIATIONS TOWARDS THE INNER MILKY WAY: A CHALLENGE TO OBSERVATIONAL COSMOLOGY", *MNRAS*, 456, 2692 (2016). [OA] 40 Citations.
- 11. S. Chatzopoulos, O. Gerhard, T. Fritz, **C. Wegg**, *et al*, "DUST WITHIN THE NUCLEAR STAR CLUSTER IN THE MILKY WAY", *MNRAS*, 453, 939 (2015). [OA] 12 Citations.
- ⇒ 12. **C. Wegg**, O. Gerhard, M. Portail, "THE STRUCTURE OF THE MILKY WAY'S BAR OUTSIDE THE BULGE", *MNRAS*, 450, 4050 (2015). [OA] 106 Citations.
- 13. M. Portail, **C. Wegg**, O. Gerhard, "PEANUTS, BREZELS AND BANANAS: FOOD FOR THOUGHT ON THE ORBITAL STRUCTURE OF THE GALACTIC BULGE", *MNRAS Letters*, 450, 66 (2015). [OA] 35 Citations.
- ⇒ 14. M. Portail, **C. Wegg**, O. Gerhard, I. Martinez-Valpuesta, "MADE-TO-MEASURE MODELS OF THE GALACTIC BOX/PEANUT BULGE: STELLAR AND TOTAL MASS IN THE BULGE REGION", *MNRAS*, 448, 713 (2015). [OA] 89 Citations.
- 15. S. Chatzopoulos, T. K. Fritz, O. Gerhard, S. Gillessen, **C. Wegg**, R. Genzel, O. Pfuhl, "THE OLD NUCLEAR STAR CLUSTER IN THE MILKY WAY: DYNAMICS, MASS, STATISTICAL PARALLAX, AND BLACK HOLE MASS", *MNRAS*, 447, 948 (2015). [OA] 90 Citations.
- ⇒ 16. J. N. Bode, **C. Wegg**, "PRODUCTION OF EMRIs IN SUPERMASSIVE BLACK HOLE BINARIES", *MNRAS*, 438, 573 (2014). [OA] 24 Citations.
- ⇒ 17. **C. Wegg**, O. Gerhard, "MAPPING THE THREE-DIMENSIONAL DENSITY OF THE GALACTIC BULGE WITH VVV RED CLUMP STARS", *MNRAS*, 435, 1874 (2013). [OA] 158 Citations.
- ⇒ 18. **C. Wegg**, E. S. Phinney, "WHITE DWARF KINEMATICS VERSUS MASS", *MNRAS*, 426, 427 (2012). [OA] 17 Citations.
- ⇒ 19. **C. Wegg** "PSEUDO-NEWTONIAN POTENTIALS FOR NEARLY PARABOLIC ORBITS," *ApJ*, 749, 183 (2012). [OA] 21 Citations.
- ⇒ 20. **C. Wegg**, J. N. Bode, "MULTIPLE TIDAL DISRUPTIONS AS AN INDICATOR OF BINARY SUPERMASSIVE BLACK HOLE SYSTEMS," *ApJL*, 738, L8 (2011). [OA] 49 Citations.

OTHER REFEREED PUBLICATIONS

Publications 1,2 and 3 are conference proceedings. Number 4 was an invited article in the ESO Messenger. Note that I wrote publication 2, while the lead author presented at the conference.

- 1. **C. Wegg**, O. Gerhard, M. Portail, "THE IMF IN THE GALACTIC DISK AND BULGE ARE INDISTINGUISHABLE," *Rediscovering our Galaxy, Proceedings of IAUS334*, 90 (2018).
- 2. O. Gerhard, **C. Wegg**, M. Portail, "PHOTOMETRIC SURVEYS OF THE GALACTIC BULGE AND LONG BAR," *The Universe of Digital Sky Surveys, Astrophysics and Space Science Proceedings*, 42, 41 (2016).
- 3. O. Gerhard, **C. Wegg**, "THE GALACTIC BAR ," *Lessons from the Local Group*, p. 43 (2015).
- 4. **C. Wegg**, O. Gerhard, "THE MILKY WAY'S BOX/PEANUT BULGE: MEASURING ITS THREE-DIMENSIONAL STRUCTURE USING THE VVV SURVEY," *The Messenger*, 154, 54 (2013). Invited article in ESO Messenger.

PRESS RELEASES FOR FIRST AUTHOR WORK

- 1. "ONE LONG MILKY WAY BAR AND BULGE," *MPE Press Release* (2015).
- 2. "THE PEANUT AT THE HEART OF OUR GALAXY ," *ESO Press Release 1339* (2013).

3. "THE INSIDE OF OUR MILKY WAY IN 3D," MPE Press Release (2013).

TALKS AT INTERNATIONAL CONFERENCES

Conferences in which I presented an invited review talk highlighted with ⇒.

Note: I have not included colloquia or other departmental talks, only international conferences.

- ⇒ 1. "THE LIFE AND TIMES OF THE MILKY WAY," Shanghai, China (2018).
- ⇒ 2. "UNDERSTANDING THE DUALITY OF THE MILKY WAY," EWASS, Liverpool, UK (2018).
3. "IAU SYMPOSIUM 334:REDISCOVERING OUR GALAXY," Potsdam, Germany (2017).
4. "EWASS", Prague, Czech Republic (2017).
5. "VVV SCIENCE MEETING", Edinburgh, UK (2017).
- ⇒ 6. "MICROLENSING 21," Pasadena, USA (2017).
7. "GALACTIC ARCHAEOLOGY & STELLAR PHYSICS", Canberra, Australia (2016).
8. "EWASS", Athens, Greece (2016).
9. "GALACTIC SURVEYS", Sexten Center for Astrophysics, Italy (2016).
10. "EWASS", Tenerife, Spain (2015).
11. "FORMATION AND EVOLUTION OF THE GALACTIC BULGE", Sexten Center for Astrophysics, Italy (2014).
12. "THE ROLE OF BARS IN GALAXY EVOLUTION", Granada, Spain (2013).

PRESENTED POSTERS AT INTERNATIONAL CONFERENCES

1. "THE MILKY WAY AND ITS ENVIRONMENT", IAP, Paris (2016)
2. "RAINBOWS ON THE SOUTHERN SKY", ESO, Germany (2015)
3. "RESOLVED AND UNRESOLVED STELLAR POPULATIONS", ESO, Germany (2014)
4. "SINGLE AND DOUBLE BLACK HOLES IN GALAXIES", Michigan, USA (2011)
5. "AAS 209", Seattle, USA (2007)