

# Chentao YANG (杨辰涛)

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**Employment**

- Postdoc, Chalmers University of Technology, Göteborg, Sweden 2021.11 – present
- European Southern Observatory (ESO) Fellow, Santiago, Chile 2017.11 – 2021.10  
(50% independent research + 50% ALMA duty)

**Education**

- (Co-tutelle) PhD of Astrophysics  
Institut d'Astrophysique Spatiale, Université Paris-Saclay, France 2014 – 2017  
Purple Mountain Observatory, Chinese Academy of Sciences, P.R. China 2013 – 2017
- Master of Astrophysics  
Astronomy Department, Beijing Normal University, P.R. China 2010 – 2013  
Master's degree in Astrophysics,
- Bachelor of Astronomy,  
Astronomy Department, Beijing Normal University, P.R. China 2006 – 2010

**Research Interests**

- Obscured galaxy nuclei near and far
- Submillimeter water maser in high-redshift galaxies
- Millimeter and submillimeter molecular spectral line surveys at high redshifts
  - **SUNRISE** – Submillimeter molecUlar liNe suRveys in dIstant duSty galaxiEs
- Submillimeter H<sub>2</sub>O lines as the ISM tracers in dusty galaxies near and far

**31 accepted  
PI Proposals  
531 h in total**  
(<sup>A/B</sup>: A/B-rated)

- The Atacama Large Mm/submm Array (**ALMA**), **8 proposals, 63.9 h<sup>12m</sup> + 50 h<sup>7m</sup>**. since 2017
  - 2017.A.00053.S (ACA observatory filler program, **50 h**);
  - 2018.1.00861.S<sup>B</sup>(EU, **10.4 h**), 2018.1.00797.S<sup>B</sup>(EU, **6.6 h**), 2018.1.01710.S(EU, **9.1 h**);
  - 2019.1.00205.S<sup>B</sup>(EU, **23.2 h**), 2019.1.00533.S<sup>B</sup>(EU, **4.8 h**), 2019.1.00310.S(EU, **8.0 h**);
  - 2022.1.00172.S(EU, **31.8 h**);
- The NOthern Extended Millimeter Array (**NOEMA**), **13 proposals, 138 h**. since 2013
  - W0B3<sup>B</sup>, S14CT<sup>B</sup>, S15CT<sup>B</sup>, W15EQ<sup>B</sup>, S16CG<sup>B</sup>, S16CF<sup>B</sup>, S16BT<sup>B</sup>, W16DQ<sup>B</sup>, W16DO<sup>B</sup>, S18DC<sup>A</sup>, S18CT<sup>A</sup>, W18EB<sup>A</sup>, W22DT<sup>B</sup>;
- The IRAM-30m telescope (**IRAM-30m**), **3 proposals, 76 h**. since 2015
  - 079-15<sup>A</sup>, 196-15<sup>B</sup>, 076-16<sup>A</sup>;
- The Karl G. Jansky Very Large Array (**JVLA**/NRAO), **3 proposals, 47 h**. since 2014
  - 14B-259<sup>B</sup>, 15B-177, 18B-190;
- The Atacama Pathfinder EXperiment (**APEX**/ESO) telescope, **2 proposal, 55 h**. since 2016
  - 097.B-0914<sup>B</sup> (SEPIA-5), 103.B-0471<sup>A</sup> (SEPIA-9);
- The Green Bank Telescope (**GBT**/GBO) telescope, **2 proposal, 63 h**. since 2020
  - 21A-093<sup>A</sup> (W-band); 22B-020<sup>A</sup> (W-band)

> 140 accepted proposals as a co-I, including:

ALMA (48 proposals, 8 A + 17 B + 23 C), NOEMA (65 A/B, including 1 large program, **z-GAL**), JVLA (7: 15B-320, 17A-151, 18A-340, 18B-190, 22A-211, 23A-030, and one large program **23B-169**), GTC(1), Spitzer (1), VLT (2, KMOS), IRAM-30m (6), APEX (2), JCMT (7, including 4 large programs, **JINGLE**, **MALATANG**, **AWESOME** and **RAGERS**), EVN(1) and GMRT (1 proposal).

**References**  
(alphabetical order)

- **Aalto, Susanne**: Professor, Chalmers University of Technology, Sweden • **Beelen, Alexandre**: Associate Astronomer, Laboratoire d'Astrophysique de Marseille, France • **Cox, Pierre**: Senior Scientist, Institut d'Astrophysique de Paris, France • **Gao, Yu\***: Professor, Xiamen University, China • **González-Alfonso, Eduardo**: Professor, University of Alcalá, Spain • **Impellizzeri, Violette**: Program manager, Allegro ARC, Leiden Observatory, the Netherlands • **Omont, Alain**: Emeritus Senior Scientist, Institut d'Astrophysique de Paris, France

Professor Yu Gao sadly **passed away** in 2022 at the age of 59.

## Observing Experience (> 1200 h)

- The IRAM 30m telescope (IRAM30/IRAM), 2013–2016: > 100 h;
- The James Clerk Maxwell Telescope (JCMT/EAO), 2016: > 100 h;
- The ALMA Observatory (ALMA/JAO), 2018–2021: (AoD) > 1000 h.

## Professional Service

- Referee for scientific journals: *ApJ*, *A&A*, *PASJ*;
- Expert external proposal reviewer for *JWST*, *HST*, and *JCMT*;
- Individual reviewer for the Science and Technology Facilities Council (STFC, UK);
- Member of the ESO (Chile) Fellowship Selection Committee (2019–2020);
- Member of the ALMA (JAO) Post-Doctoral Fellow Selection Committee (2019);
- Technical Secretary of the ALMA Proposal Review meeting, 2018 (Cycle 6) – 2021 (Cycle 8);
- Co-organiser of the [ALMA proposal workshop at ESO](#) (2018, 2021);
- Organisers of the [CONquest 2023 workshop](#) (2023)

## Teaching & Mentorship

- **Daysi Quinatoa** (Ph.D. student), Universidad de Valparaíso (Chile),  
APEX observation of the submillimeter H<sub>2</sub>O emission in nearby galaxies; 2021–2023
- **Malte Brinch** (PhD student), Cosmic Dawn Center (DAWN) DTU-space (Denmark),  
The excitation of [C I] lines in high-redshift dusty galaxies; 2021–2022
- **Nina Grant** (Undergraduate student), Princeton International Internship program,  
Complete the rotation curve of NGC 7528 with neutral carbon emission; June–August 2019
- Lecture, Advance topics of astrophysics and astrobiology, Universidad Andrés Bello, Chile;  
The ISM in high-redshift dusty star-forming galaxies. 2<sup>nd</sup> Semester 2019

## Grants & Awards

- **ESO Science Support Discretionary Fund (SSDF) - 9,000 EUR** 2020–2021  
Student mentoring project (on extragalactic [C I]) at European Southern Observatory
- **IAP Visitorship Grant - 700 EUR/week** March, 2020; May, 2019; July, 2018  
Institut d'Astrophysique de Paris, France
- **ESO Fellowship** 2017–2021  
European Southern Observatory, Chile
- **International Astronomical Union (IAU) Travel Grant - 1,100 USD** August 3–14, 2015  
XXIX IAU General Assembly, Honolulu, Hawaii, USA
- **The LIA-Origins Short Visit Program Grant - 3,000 EUR** 2012, 2013  
Institut d'Astrophysique de Paris & Institut d'Astrophysique Spatiale, France
- **Graduate with distinguished honour** 2010  
At the municipality level, and school level
- **National Astronomical Observatories Scholarship** 2009  
National Astronomical Observatory of China
- **National Undergraduate Innovative Test Program Grant - 10,000 CNY** 2008  
National grant for the project: Design of the experiments for the course “Radio Astronomy”

## Refereed Publications in Journals (†: 1<sup>st</sup>/2<sup>nd</sup> author) [NASA/ADS Lib.](#)

- NASA/ADS citation metrics: 992 citations in total, including 273 citations of the 1<sup>st</sup>-author papers; The most-cited 1<sup>st</sup>-author paper has 99 citations; h-index = 18, h-index/(years since PhD defence) = 3*
50. **Probing the interstellar medium of the quasar BRI 0952-0115: An analysis to [C II], [C I], CO, OH and H<sub>2</sub>O**  
K. Kade, K.K. Knudsen, A. Bewketu Belete, [C. Yang](#), S. König, F. Stanley, and J. Scholtz 2024, *A&A in press* (arXiv: 2312.10267);
  49. **Double, Double, Toil and Trouble: The tails, bubbles and knots of the local CON galaxy NGC 4418**  
C. F. Wethers, S. Aalto, G. C. Privon, F. Stanley, J. Gallagher, M. Gorski, S. König, K. Onishi, M. Sato, [C. Yang](#), R. Beswick, L. Barcos-Muñoz, F. Combes et al. 2024, *A&A* accepted;
  - †48. **The first ground-based detection of the 752 GHz water line in local ultra-luminous infrared galaxies using APEX-SEPIA** (student's paper)  
Daysi Quinatoa, [Chentao Yang](#), Edo Ibar, Elizabeth Humphreys, Susanne Aalto, Loreto Barcos-Muñoz, Eduardo González-Alfonso, Violette Impellizzeri et al. 2024, *MNRAS*, 527, 6321;
  47. **Characterisation of *Herschel*-selected strong lens candidates through *HST* and sub-mm/mm observations**  
E. Borsato, L. Marchetti, M. Negrello, E. M. Corsini, D. Wake, A. Amvrosiadis, ..., Lingyu Wang, [C. Yang](#) and Anthony Young 2023, *MNRAS in press* (arXiv: 2311.01158);

- <sup>†</sup>46. **SUNRISE: The rich molecular inventory of high-redshift dusty galaxies revealed by broadband spectral line surveys**  
Chentao Yang, Alain Omont, Sergio Martín, Thomas G. Bisbas, Pierre Cox, Alexandre Beelen, Eduardo González-Alfonso, Raphaël Gavazzi, Susanne Aalto et al. 2023, *A&A*, 680, A95; (Chalmers Press Release, Space.com, A&A Press Release, , Phys.org),
45. **z-GAL – A NOEMA spectroscopic redshift survey of bright Herschel galaxies: [III] Physical properties**  
S. Berta, F. Stanley, D. Ismail, P. Cox, R. Neri, C. Yang, A. J. Young, S. Jin, H. Dannerbauer, T. J. L. C. Bakx et al. 2023, *A&A*, 678, 28;
44. **z-GAL – A NOEMA spectroscopic redshift survey of bright Herschel galaxies: [II] Dust properties**  
D. Ismail, A. Beelen, V. Buat, S. Berta, P. Cox, F. Stanley, A. Young, S. Jin, R. Neri, T. Bakx,..., C. Yang, A. J. Baker et al. 2023, *A&A*, 678, 27;
43. **z-GAL – A NOEMA spectroscopic redshift survey of bright Herschel galaxies: [I] Overview**  
P. Cox, R. Neri, S. Berta, D. Ismail, F. Stanley, A. Young, A. Young, S. Jin, T. Bakx, ..., A. Weiss, P. van der Werf and C. Yang 2023, *A&A*, 678, 26;
42. **Discovery of a radio jet in the Cloverleaf Quasar at  $z = 2.56$**   
Lei Zhang, Zhi-Yu Zhang, James. W. Nightingale, Ze-Cheng Zou, Xiaoyue Cao, Chao-Wei Tsai, Chentao Yang, Yong Shi, Junzhi Wang et al. 2023, *MNRAS*, 524, 3671;
41. **Bright Extragalactic ALMA Redshift Survey (BEARS) III: Detailed study of emission lines from 71 *Herschel* targets**  
M. Hagimoto, T. J. L. C. Bakx, S. Serjeant, G. J. Bendo, S. A. Urquhart, S. Eales, ..., C. Yang et al. 2023, *MNRAS*, 521, 5508
40. **The SCUBA-2 Large eXtragalactic Survey: 850  $\mu$ m map, catalogue and the bright-end number counts of the XMM-LSS field**  
T. K. Garratt, J. E. Geach, Y. Tamura, K. E. K. Coppin, M. Franco, Y. Ao, C. -C. Chen, C. Cheng, D. L. Clements, Y. S. Dai, ..., C. Yang 2023, *MNRAS*, 520, 3669
39. **A survey of CO(1–0) emission in high- $z$  *Herschel* selected galaxies**  
F. Stanley, B. M. Jones, D. Riechers, C. Yang, S. Berta, P. Cox, T.J.L.C. Bakx et al. 2023, *ApJ*, 945, 24
38. **The Bright Extragalactic ALMA Redshift Survey (BEARS) II: Millimetre photometry of gravitational lens candidates**  
G. J. Bendo, S. A. Urquhart, S. Serjeant, T. Bakx, ..., C. Yang, A. Young 2023, *MNRAS*, 522, 2995
37. **The Opaque Heart of the Galaxy IC 860: Analogous Protostellar, Kinematics, Morphology, and Chemistry**  
M. D. Gorski, S. Aalto, S. König, C. Wethers, C. Yang, S. Muller, S. Viti, J. H. Black, K. Onishi, M. Sato 2023, *A&A*, 670, 70
36. **The importance of radiative excitation on the H<sub>2</sub>O submillimeter emission lines in galaxies**  
E. González-Alfonso, Jacqueline Fischer, Javier R. Goicoechea, Chentao Yang, Miguel Pereira-Santaella and Kenneth P. Stewart 2022, *A&A*, 666, L3
35. **Gas properties in the Early Universe deciphered from spectral line surveys of high- $z$  objects: The Cloverleaf Quasar**  
Michel Guélin, Carsten Kramer, Chentao Yang, Belen Tercero, and Jose Cernicharo 2022, *EPJ Web of Conferences* 265, 00024
34. **Dense Gas and Star Formation in Nearby Infrared Bright Galaxies: APEX survey of HCN and HCO<sup>+</sup>  $J = 2 \rightarrow 1$**   
Jing Zhou, Zhi-Yu Zhang, Yu Gao, Junzhi Wang, Yong Shi, Qiusheng Gu, Fei Li, Chentao Yang, Tao Wang and Qing-hua Tan 2022, *ApJ*, 936, 58;
33. **Massive molecular gas reservoir in a luminous sub-millimeter galaxy during cosmic noon**  
Bin Liu, N. Chartab, H. Nayyeri, A. Cooray, C. Yang, D. A. Riechers, M. Gurwell, Zong-hong Zhu,... and P. van der Werf 2022, *ApJ*, 929, 41;
32. **Bright Extragalactic ALMA Redshift Survey (BEARS) I: redshifts of bright gravitationally-lensed galaxies from the *Herschel* ATLAS**

- S. A. Urquhart, G. J. Bendo, S. Serjeant, T. Bakx, M. Hagimoto, P. Cox, R. Neri, M. Lehnert, ..., [C. Yang](#), A.J. Young **2022**, *MNRAS*, **551**, 3017;
- 31. The ramp-up of interstellar medium enrichment at  $z > 4$ ;** ([ESO Press Release](#), [ALMA Press Release](#), [Phys.org News](#), [Daily Mail news](#), [CNN news](#))  
M. Franco, K. E. K. Coppin, J. E. Geach, C. Kobayashi, S. C. Chapman, [C. Yang](#), E. González-Alfonso, J. S. Spilker, A. Cooray, M. J. Michałowski **2021**, *Nature Astronomy*;
- 30. An ACA 1mm survey of HzRGs in the ELAIS-S1: survey description and first results;**  
Hugo G. Messias, Evanthia Hatziminaoglou, Pascale Hibon, Israel Matute, Tony Mroczkowski, José M. Afonso, Edward Fomalont, ..., [Chentao Yang](#) **2021**, *MNRAS*, **508**, 5259;
- 29. Close-up view of a luminous star-forming galaxy at  $z = 2.95$ ;**  
S. Berta, A. J. Young, P. Cox, R. Neri, B. M. Jones, A. J. Baker, A. Omont, ..., [C. Yang](#), D. A. Riechers, H. Dannerbauer, I. Perez-Fournon, P. van der Werf et al. **2021**, *A&A*, **646**, A122;
- 28. A proto-pseudobulge in ESO 320-G030 fed by a massive molecular inflow driven by a nuclear bar;** ([Harvard CfA Press Release](#), [Phys.org News](#))  
E. González-Alfonso, M. Pereira-Santaella, J. Fischer, S. García-Burillo, [C. Yang](#), A. Alonso-Herrero, L. Colina, M. L. N. Ashby, H. A. Smith et al. **2021**, *A&A*, **645**, A49;
- 27. Planck's Dusty GEMS. VIII. Dense gas reservoirs in the most active dusty starbursts at  $z \sim 3$ ;**  
R. Cañameras, N. P. H. Nesvadba, R. Kneissl, S. König, [C. Yang](#), A. Beelen, R. Hill, E. Le Floch and D. Scott **2021**, *A&A*, **645**, A45;
- 26. ALMA [N II] 205  $\mu\text{m}$  imaging spectroscopy of the lensed submillimeter galaxy ID 141 at redshift 4.24;**  
Cheng Cheng, Xiaoyue Cao, Nanyao Lu, [Chentao Yang](#), Dimitra Rigopoulou, Vassilis Charmandaris et al. **2020**, *ApJ*, **898**, 33;
- <sup>†</sup>**25. Etching glass in the early Universe: Luminous HF and H<sub>2</sub>O emission in a QSO-SMG pair at  $z = 4.7$ ;**  
M. D. Lehnert, [C. Yang](#), B.H.C. Emonts, A. Omont, E. Falgarone, P. Cox, and P. Guillard **2020**, *A&A*, **641**, A124;
- 24. The MALATANG Survey: Dense Gas and Star Formation from High Transition HCN and HCO<sup>+</sup> maps of NGC 253;**  
Xuejian Jiang, Thomas R. Greve, Yu Gao, Zhi-Yu Zhang, ..., [Chentao Yang](#), Qian Jiao, Aeree Chung et al. **2020**, *MNRAS*, **494**, 1276;
- <sup>†</sup>**23. The first detection of the 448 GHz ortho-H<sub>2</sub>O line at high redshift: probing the structure of a starburst nucleus at  $z \sim 3.63$**   
[C. Yang](#), E. González-Alfonso, A. Omont, M. Pereira-Santaella, J. Fisher, A. Beelen, R. Gavazzi **2020**, *A&A*, **634**, L3;
- 22. A declining starburst at  $z = 4.72$  lensed by a merging pair of massive galaxies at  $z = 1.48$ ;**  
L. Ciesla, M. Béthermin, E. Daddi, J. Richard, T. Diaz-Santos, M. Sargent, D. Elbaz, M. Boquien, T. Wang, C. Schreiber, [C. Yang](#), J. Zabl et al. **2020**, *A&A*, **635**, A27;
- 21. NOEMA Redshift Measurements of Bright *Herschel* Galaxies;**  
R. Neri, P. Cox, A. Omont, A. Beelen, S. Berta, ..., [C. Yang](#) and A.J. Young **2020**, *A&A*, **635**, A7;
- 20. A SCUBA-2 Selected Herschel-SPIRE Dropout and the Nature of this Population;**  
J. Greenslade, E. Aguilar, D. L. Clements, H. Dannerbauer, T. Cheng, G. Petitpas, [C. Yang](#), H. Messias et al. **2019**, *MNRAS*, **490**, 5317;
- 19. JINGLE V: Dust properties of nearby galaxies derived from hierarchical Bayesian SED fitting;**  
Isabella Lamperti, Amélie Saintonge, Ilse De Looze, Gioacchino Accurso, Christopher J. R. Clark, Matthew W. L. Smith, Christine D. Wilson, ..., [Chentao Yang](#) **2019**, *MNRAS*, **489**, 4389;
- 18. JINGLE, a JCMT legacy survey of dust and gas for galaxy evolution studies: II. SCUBA-2 850  $\mu\text{m}$  data reduction and dust flux density catalogues;**  
Matthew W. L. Smith, Christopher J. R. Clark, Ilse De Looze, Isabella Lamperti, Amélie Saintonge, Christine D. Wilson, ..., [Chentao Yang](#) and Ming Zhu **2019**, *MNRAS*, **486**, 4166;
- 17. The molecular-gas properties in the gravitationally lensed merger HATLAS J142935.3-002836;**  
Hugo Messias, Neil Nagar, Zhi-Yu Zhang, Iván Oteo, Simon Dye, Nicholas Timmons, Eduardo Ibar, ..., and [Chentao Yang](#) **2019**, *MNRAS*, **486**, 2366;

- †16. **CO, H<sub>2</sub>O, H<sub>2</sub>O<sup>+</sup> line and dust emission in a  $z = 3.63$  strongly lensed starburst merger at sub-kiloparsec scales;**  
C. Yang, R. Gavazzi, A. Beelen, P. Cox, A. Omont, M. Lehnert, Y. Gao, R. J. Ivison, A. M. Swinbank, L. Barcos-Muñoz, R. Neri, A. Cooray, S. Dye, S. Eales et al. 2019, *A&A*, 624, A138;
15. **Planck’s Dusty GEMS. VII. Atomic carbon and molecular gas in dusty starburst galaxies at  $z = 2$  to 4;**  
N. P. H. Nesvadba, R. Cañameras, R. Kneissl, S. Koenig, C. Yang, E. Le Floc’h, A. Omont and D. Scott 2019, *A&A*, 624, A23;
14. **VALES V: A kinematic analysis of the molecular gas content in *H*-ATLAS galaxies at  $z \sim 0.03$ – $0.35$  using ALMA;**  
J. Molina, E. Ibar, V. Villanueva, A. Escala, C. Cheng, M. Baes, H. Messias, C. Yang, F.E. Bauer, P. P. Van der Werf, R. Leiton, M. Aravena, ..., S. Eales & L. Dunne 2019, *MNRAS*, 482, 1499;
- †13. **Planck’s Dusty GEMS. VI. Multi-*J* CO excitation and interstellar medium conditions in dusty starburst galaxies at  $z = 2$ –4;** (*IRAM Press Release*, *CEA Press Release*)  
R. Cañameras, C. Yang, N. P. H. Nesvadba, A. Beelen, R. Kneissl, S. Koenig, E. Le Floc’h, M. Limousin, S. Malhotra, A. Omont, D. Scott 2018, *A&A*, 620, A61;
12. **JINGLE, a JCMT legacy survey of dust and gas for galaxy evolution studies: I. Survey overview and first results;**  
Amélie Saintonge, Christine D. Wilson, Ting Xiao, Lihwai Lin, Ho Seong Hwang, Tomoka Tosaki, ..., Chentao Yang, Ming Zhu et al. 2018, *MNRAS*, 481, 3497;
11. **Far-infrared *Herschel* SPIRE spectroscopy of lensed starbursts reveals physical conditions of ionised gas;**  
Zhi-Yu Zhang, R. J. Ivison, R. D. George, Yinghe Zhao, L. Dunne, ..., Chentao Yang, Stephen Eales, Ros Hopwood, Steve Maddox, Alain Omont et al. 2018, *MNRAS*, 481, 59;
10. **Extreme conditions in the molecular gas of lensed star-forming galaxies at  $z \sim 3$ ;**  
Paola Andreani, Edwin Retana-Montenegro, Zhi-Yu Zhang, Padelis Papadopoulos, Chentao Yang, Simona Vegetti 2018, *A&A*, 615, A142;
9. **The MALATANG Survey: the  $L_{\text{gas}} - L_{\text{IR}}$  correlation on sub-kiloparsec scale in six nearby star-forming galaxies as traced by HCN  $J = 4 - 3$  and HCO<sup>+</sup>  $J = 4 - 3$ ;**  
Qing-Hua Tan, Yu Gao, Zhi-Yu Zhang, Thomas Greve, Xue-Jian Jiang, Christine Wilson, Chen-Tao Yang, Ashley Bemis, Aeree Chung et al. 2018, *ApJ*, 860, 165;
8. **VALES: IV. Exploring the transition of star formation efficiencies between normal and starburst galaxies using APEX/SEPIA and ALMA at low redshift;**  
C. Cheng, E. Ibar, T. M. Hughes, V. Villanueva, R. Leiton, G. Orellana, A. Munoz-Arancibia, N. Lu, C. K. Xu, C. N. A. Willmer, J. Huang, T. Cao, C. Yang et al. 2018, *MNRAS*, 475, 248;
7. **The *Herschel* Bright Sources (HerBS): Sample definition and SCUBA-2 observations;**  
Tom J. L. C. Bakx, S. A. Eales, M. Negrello, M. W. L. Smith, E. Valiante, W. S. Holland, M. Baes, N. Bourne, D. L. Clements, ..., P. van der Werf, C. Yang 2018, *MNRAS*, 273, 1751;
6. **High dense gas fraction in intensely star forming dusty galaxies;**  
I. Oteo, Z.-Y. Zhang, C. Yang, R. J. Ivison, A. Omont, M. Bremer, S. Bussmann, A. Cooray, P. Cox, H. Dannerbauer, L. Dunne, S. Eales, ..., and P. Van der Werf 2017, *ApJ*, 850, 170;
- †5. **Molecular gas in the *Herschel* - selected strongly lensed submillimeter galaxies at  $z \sim 2$ –4 as probed by multi-*J* CO lines;** (*Code on Github: radex\_emcee*)  
C. Yang, A. Omont, A. Beelen, Y. Gao, P. van der Werf, R. Gavazzi, Z.-Y. Zhang, R. Ivison, M. Lehnert, D. Liu, I. Oteo, E. González-Alfonso et al. 2017, *A&A*, 608, A144;
- †4. **Submillimeter H<sub>2</sub>O and H<sub>2</sub>O<sup>+</sup> emission in lensed ultra- and hyper-luminous infrared galaxies at  $z \sim 2$ –4;**  
C. Yang, A. Omont, A. Beelen, E. González-Alfonso, R. Neri, Y. Gao, P. van der Werf, A. Weiß, R. Gavazzi, N. Falstad, A. J. Baker, R. S. Bussmann, A. Cooray et al. 2016, *A&A*, 595, A80;
3. **High-*J* CO Versus far-infrared relations in normal and starburst galaxies;**  
Daizhong Liu, Yu Gao, Kate Isaak, Emanuele Daddi, Chentao Yang, Nanyao Lu and Paul van der Werf 2015, *ApJ*, 810, L14;
- †2. **Water vapor in nearby infrared galaxies as probed by *Herschel*;**  
Chentao Yang, Yu Gao, A. Omont, Daizhong Liu, K. G. Isaak, D. Downes, P. P. van der Werf and Nanyao Lu 2013, *ApJ*, 771, L24;
- †1. **H<sub>2</sub>O emission in high-*z* ultra-luminous infrared galaxies;** (*A&A Highlight*)



**Submitted  
Articles  
&  
Reviews  
In prep.**

A. Omont, [C. Yang](#), P. Cox, R. Neri, A. Beelen, R. S. Bussmann, R. Gavazzi, P. van der Werf, D. Riechers, D. Downes and *40 other authors* 2013, *A&A*, 551, A115;

- **CONquest II. Spatially and spectrally resolved HCN/HCO<sup>+</sup> line ratios in local luminous and ultraluminous infrared galaxies**  
Y. Nishimura, S. Aalto, M. D. Gorski, S. König, K. Onishi, C. Wethers, [C. Yang](#), L. Barcos-Muñoz, F. Combes, T. Díaz-Santos, J. S. Gallagher et al., submitted to A&A;
- **CONFirm: A Spectacular Galactic Scale MHD-Powered Wind in ESO 320-G030**  
M. D. Gorski, S. Aalto, S. König, C. F. Wethers, [C. Yang](#), S. Muller, K. Onishi, M. Sato, N. Falstad et al., submitted to NatAstr;
- **Dust and Cold Gas Properties of Starburst HyLIRG-Quasars at  $z \sim 2.5$**   
Feng-Yuan Liu, Y. Sophia Dai, Alain Omont, ..., [Chentao Yang](#), Xue-Bing Wu, and Jia-Sheng Huang, submitted to ApJ;
- **A candidate dusty protocluster core surrounding a binary galaxy system**  
Tom J. L. C. Bakx, S. Berta, H. Dannerbauer, P. Cox, M. Hagimoto, D. H. Hughes, D. A. Riechers, P. P. van der Werf, [C. Yang](#), ..., A. Weiß, and A. J. Young, submitted to MNRAS;
- **Serendipitous Discovery of an Optically-Dark Hyper-Luminous Infrared Galaxy at  $z = 3.4$**   
Natsuki H. Hayatsu, Zhi-Yu Zhang, R.J. Ivison, Chao-wei Tsai, ..., [Chentao Yang](#), ... and Junfeng Wang, submitted to MNRAS;

*Invited Review* • **Extragalactic water new and far**

[Chentao Yang](#), Eduardo González-Alfonso & Alain Omont, to be submitted to Royal Society Open Science (RSOS);

**Presentations** 2015-2023, ordered by category: **2 invited** conference talks, **11 contributed** talks, and 18 (incl. **9 invited**) seminar/colloquium talks

(<sup>‡</sup>: invited)

<sup>‡</sup>*Invited review talk*

- “Water in the Universe” Symposium, ACS Fall 2019 National Meeting & Exposition, San Diego, California, USA August 25–29, 2019  
**Water vapor in galaxies at high redshift**

<sup>‡</sup>*Invited conference talk*

- The ALMA Quest for Our Cosmic Origins, Joint ALMA Observatory (JAO), Vitacura, Santiago, Chile March 27, 2018  
**Physical conditions of the ISM in high-redshift lensed submillimeter galaxies**

*Contributed talk*

- Galaxy Formation in Hangzhou: Observations and Physics of AGN Feedback (AGN Feedback 2023), Hangzhou, China October 9–13, 2023  
**5–12 pc resolution ALMA imaging of gas and dust in the obscured compact nucleus of IRAS 17578-0400**

*Contributed talk*

- Tuning to the High Frequency ALMA Universe, the Lorentz Center @Oort, Leiden, the Netherlands September 4–8, 2023  
**A Long Way Home: extragalactic submillimeter water lines from high-redshift to our local Universe**

*Contributed talk*

- 2023 Kavli-IAU Astrochemistry Symposium: Astrochemistry VIII - From the First Galaxies to the Formation of Habitable Worlds, Traverse City, USA July 10–14, 2023  
**The rich molecular inventory of high-redshift dusty galaxies revealed by broadband spectral line surveys**

*Contributed talk*

- Black hole winds at all scales, IAUS 378, Technion, Haifa, Israel March 12–16, 2023  
**5–12 pc resolution ALMA imaging of gas and dust in the obscured compact nucleus of IRAS 17578-0400**

*Contributed talk*

- Behind a Curtain of Dust IV, Sexten Bozen, Italy July 11–15, 2022  
**The rich molecular inventory of dusty galaxies at high redshifts**

*Contributed talk*

- Multi-line Diagnostics of the Interstellar Medium, Nice, France April 4–6, 2022  
**The rich molecular inventory of two dusty galaxies twelve billion years ago**

*Contributed talk*

- KIAA forum on gas in galaxies: Multiple-phase Interstellar medium – Probing the Activities and Power Engines from Local to Distant Universe, Beijing, China September 9–13, 2019  
**The interstellar medium in high-redshift strongly gravitational lensed galaxies**

*Contributed talk*

- Views on the Interstellar Medium in galaxies in the ALMA era, Bologna, Emilia-Romagna, Italy September 2–6, 2019  
**Studying the ISM in high-redshift strongly lensed galaxies in the ALMA era**

- Contributed talk* • The Laws of Star Formation: From the Cosmic Dawn to the Present Universe, Cambridge University, UK  
July 2–6, 2018  
**Molecular gas in high-redshift strongly lensed dusty starbursts as traced by multi- $J$  CO lines**
- Contributed talk* • The Eighth Sino-French “LIA-origins” Workshop: Probing Baryons in the Universe, Sèvres, Hauts-de-Seine, France  
November 14–18, 2016  
 **$H_2O$  and  $H_2O^+$  emission in lensed hyper/ultra-luminous infrared galaxies at  $z \sim 2-4$**
- Contributed talk* • Water in the Universe: From Clouds to Oceans, European Space Agency (ESA/ESTEC), Noordwijk, Netherland  
April 11–15, 2016  
 **$H_2O$  Emission in Ultra-luminous Infrared Galaxies at High- $z$**
- ‡Colloquium talk* • University of Massachusetts Amherst & the Five College Astronomy Department, Massachusetts, USA  
February 25, 2021  
**Physical conditions of the ISM in dusty star-forming galaxies in the early universe**
- Colloquium talk* • European Southern Observatory (ESO Santiago), Chile  
November 21, 2019  
**Water vapor in galaxies near and far**
- ‡Seminar talk* • Department of astronomy, Nanjing University, Nanjing, China  
October 13, 2023  
**SUNRISE: The rich molecular inventory of high-redshift dusty galaxies revealed by broadband spectral line surveys**
- ‡Seminar talk* • Xinjiang Astronomical Observatory, Urumqi, China  
October 7, 2023  
**SUNRISE: The rich molecular inventory of high-redshift dusty galaxies revealed by broadband spectral line surveys**
- ‡Seminar talk* • South-Western Institute For Astronomy Research (SWIFR), China (online)  
October 12, 2022  
**The dusty ISM in high-redshift strongly lensed submillimeter galaxies**
- ‡Seminar talk* • Ecole Normale Supérieure (ENS), Paris, France (online)  
May 19, 2022  
**The dusty ISM in high-redshift strongly lensed submillimeter galaxies**
- ‡Seminar talk* • The Dominion Radio Astrophysical Observatory (DRAO), Kaleden, British Columbia, Canada (online)  
October 7, 2020  
**Extragalactic water across cosmic time**
- ‡Seminar talk* • CAS South America Center for Astronomy, Santiago, Chile  
January 8, 2020  
**Water vapor in galaxies near and far**
- ‡Seminar talk* • Astronomy Department, Beijing Normal University, China  
September 9, 2019  
**Water vapor in galaxies near and far**
- ‡Seminar talk* • The Cosmic Dawn Center, DTU-Space division, Denmark  
December 12, 2018  
**Physical conditions of the ISM in strongly lensed dusty star-forming galaxies in the early universe**
- Seminar talk* • Zhejiang Lab, Hangzhou, China  
October 13, 2023  
**SUNRISE: The rich molecular inventory of high-redshift dusty galaxies revealed by broadband spectral line surveys**
- Seminar talk* • Shanghai Observatory, Shanghai, China  
October 9, 2023  
**SUNRISE: The rich molecular inventory of high-redshift dusty galaxies revealed by broadband spectral line surveys**
- Seminar talk* • Centre for Extragalactic Astronomy, Durham University, UK  
June 29, 2018  
**Physical conditions of the interstellar medium in strongly lensed submillimeter galaxies at high-redshift**
- Seminar talk* • Department of Physics, Oxford University, UK  
June 28, 2018  
**Physical conditions of the ISM in high-redshift strongly lensed dusty star-forming galaxies**
- Seminar talk* • Instituto de Física y Astronomía, Universidad de Valparaíso, Chile  
January 18, 2018  
**Physical conditions of the ISM in high-redshift lensed submillimeter galaxies**
- Seminar talk* • Institute of Astrophysics, PUC de Chile, Santiago, Chile  
December 20, 2017  
**Physical conditions of the interstellar medium in high-redshift lensed submillimeter galaxies**
- Seminar talk* • CAS South America Center for Astronomy, Santiago, Chile  
December 11, 2017  
**Tracing the physical conditions of the interstellar medium in high-redshift lensed submillimeter galaxies**
- Seminar talk* • Astronomy Department, Beijing Normal University, China  
December 23, 2016

## Physical conditions of the ISM in high-redshift submillimeter galaxies

### Computer Skills

Languages: Shell (Unix/Linux), Python (NumPy, Pandas, Matplotlib, etc.), Julia, IDL, FORTRAN, MATLAB,  $\LaTeX$   
Operating systems: GNU/Linux (CentOS, openSUSE, Ubuntu, etc.), macOS, Windows  
Astronomy Softwares: GILDAS, Starlink, CARTA, CASA, HIPE, TOPCAT, DS9

### Outreach Experiences

- **Core member of the Astronomy Club** 2007-2009  
Beijing Normal University
- **Authors of outreach articles (6 in total)** 2014-2017  
The “Amateur Astronomer” magazine  
(sponsored by Chinese Astronomical Society & Beijing Planetarium)
- **ALMA virtual tour guider** November 5, 2020  
Virtual guided tour of the ESO sites (for ESO Studentship candidates)

(Last update: December, 2023. Contents in [green](#) and [purple](#) are clickable links.)