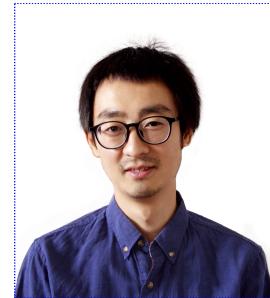


# Jianqiang Sky Zhou, Ph.D.

Data / Computer Vision Scientist

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-  <https://github.com/mxz2013>
-  <https://mzx2013.github.io/online-cv/>
-  <https://www.linkedin.com/in/sky-zhou/>
-  Chinese, holding the Carte de Résident de Longue Durée - UE



## EXPERIENCE

- 2020 – now  **Solution scientist** Flyinstinct.  
A startup provides a digital platform for airport inspections developed with the most advanced technologies of computer vision and AI algorithm.
- Proof of concept: Design new algorithms based on computer vision technique. Implement them in Python, and prove their performance in our industrial products.
  - Data analysis: Extract information from images, analyze them according to the requirement of the products, which helps to design better algorithms.
  - Software team lead: explain and discuss daily tasks and distribute daily work. Provide the best direction to go for product development based on team members' ability.
- 2018 – 2020  **Post-doctoral Fellow** Sorbonne Université, Institut des Nanosciences de Paris.  
Supervisor: Matteo Calandra
- Applied a machine-learning type approach (minimize the gradients of the energy using conjugate gradient or steepest descent algorithm) to compute physical concepts.
- 2016 – 2018  **Post-doctoral Fellow** Laboratoire des Solides Irradiés, École Polytechnique.  
Supervisor: Lucia Reining
- Developed mathematical methods and implemented it in a software (in Python) for bleeding-edge numerical simulations, leading to several top-tier peer-reviewed publications. See details at  <https://github.com/mxz2013/CumuPy>.
  - Proposed and participated an bleeding-edge experiment to confirm my theoretical predictions, with collaborations with researchers from different domains, and different countries.
  - Received 3 invitations for giving a seminar on my researching projects, and published one article which applies probability theory in physics.
  - Organized ETSF correlation team meeting at École Polytechnique, France (+30 participants worldwide).

## SKILLS

- Languages  English, Chinese, French.
- Data science  Programming & Database: Python, Wolfram Mathematica, Fortran, Bash, SQL.  
Computer Vision: OpenCV.  
Development & Maintenance: Git, SVN.  
Editor: VI, Pycharm, Jupyter Notebook, L<sup>A</sup>T<sub>E</sub>X, Microsoft Office.  
Math & Statistics: Machine learning, deep learning, quantitative research.
- Soft skills  Problem solver, passionate about data analysis, curious about new technology, story-telling (presentation), strong sense of responsibility (family and work), planning and organization.

## EDUCATION

2013 – 2016

- Ph.D. in Theoretical Physics, École Polytechnique, France.  
Supervisor: Lucia Reining

- Led multiple joint projects producing several top-tier peer-reviewed publications;
- Developed mathematical methods beyond state of the art for the analysis of solids, implemented them into scientific computing software.
- Participated 10 international conferences with 7 oral presentations and 3 posters (with one best poster prize).
- Co-organized the 12th ETSF Young Researchers' Meeting in Paris, France (+70 participants worldwide).

2010 – 2012

- M.Sc. in Erasmus Mundus – Master of Molecular Nano- and Biophotonics for telecommunications and biotechnologies (MONABIPHOT), École Normale Supérieure de Cachan, France. Titre avec la mention BIEN.
- Won the Erasmus Mundus Scholarship (48K € for a two-year study in Europe).
  - Acquired multidisciplinary knowledge on biology, chemistry, and physics.

2005 – 2009

- B.Sc. in Optoelectronic Engineering, Harbin institute of technology, China. **GPA: 85/100 .**

## ACADEMIC PUBLICATIONS

### High impact journal articles

- 1 Zhou, J. S., Bianco, R., Monacelli, L., Errea, I., Mauri, F. & Buonaura, M. C. (2020). Theory of the thickness dependence of the charge density wave transition in  $\text{t}_{\text{it}}\text{-}\text{tite}_2$ . *2D Materials*.  <http://iopscience.iop.org/10.1088/2053-1583/abae7a>
- 2 Zhou, J. S., Monacelli, L., Bianco, R., Errea, I., Mauri, F. & Calandra, M. (2020). Anharmonic melting of the charge density wave in single-layer  $\text{Tise}_2$ . *Nano Letters*, 20(7), 4809–4815. PMID: 32496779. doi:10.1021/acs.nanolett.0c00597
- 3 Zhou, J. S., Reining, L., Nicolaou, A., Bendounan, A., Ruotsalainen, K., Vanzini, M., ... Gatti, M. (2020). Unraveling intrinsic correlation effects with angle-resolved photoemission spectroscopy. *Proceedings of the National Academy of Sciences*.  <https://www.pnas.org/content/117/46/28596>
- 4 Borgatti, F., Berger, J. A., Céolin, D., Zhou, J. S., Kas, J. J., Guzzo, M., ... Egdell, R. G. (2018). Revisiting the origin of satellites in core-level photoemission of transparent conducting oxides: The case of n-doped  $\text{SnO}_2$ . *Phys. Rev. B*, 97, 155102. doi:10.1103/PhysRevB.97.155102.
- 5 Gonze, X., Zhou, J. S. & Reining, L. (2018). Variations on the “exact factorization” theme. *The European Physical Journal B*, 91(10), 224. doi:10.1140/epjb/e2018-90278-2.
- 6 Zhou, J. S., Gatti, M., Kas, J. J., Rehr, J. J. & Reining, L. (2018). Cumulant green's function calculations of plasmon satellites in bulk sodium: Influence of screening and the crystal environment. *Phys. Rev. B*, 97, 035137. doi:10.1103/PhysRevB.97.035137.
- 7 Zhou, J. S., Reining, L., Nicolaou, A., Bendounan, A., Ruotsalainen, K., Vanzini, M., ... Gatti, M. (2018). Dispersing and non-dispersing satellites in the photoemission spectra of aluminum. *Submitted to Phys. Rev. Lett.* arXiv: 1811.12217.  <http://arxiv.org/abs/1811.12217>.
- 8 Zhou, J. S. et al. (2015b). Dynamical effects in electron spectroscopy. *The Journal of Chemical Physics*, 143(18), 184109. doi:10.1063/1.4934965.
- 9 Zhou, Y. P., Chang, G. L., Zhou, J. S. et al. (2009). Gamma-ray irradiation effects on distributed-feedback laser diodes. *Journal of Russian Laser Research*, 30(2), 164–171.

### Conference talks

- 1 Zhou, J. S. (2019). Photoemission spectroscopy from first principles. In *(Invited) seminar by the materials and nanosciences research department of the institute of physics, rennes i university*, Rennes, France.

- 2 Zhou, J. S. et al. (2019a). Charge density wave in mono-layer TiSe<sub>2</sub>. In *16th ETSF young researchers' meeting*, San Sebastian, Spain.
- 3 Zhou, J. S. (2017a). Challenges for the cumulant approach in valence photoemission of metals. In *(Invited) by CECAM workshop: Green's function methods: The next generation III*, Toulouse, France.
- 4 Zhou, J. S. (2017b). Photoemission spectroscopy from first principles. In *(Invited) by mini-workshop "REST in Paris"*, Paris, France.
- 5 Zhou, J. S. et al. (2015a). Alternative routes for calculations of total energies. In *Psi-k 2015 conference*, San Sebastian, Spain.
- 6 Zhou, J. S. & Reining, L. (2015a). An improved description of fermion-plasmon coupling in green's function calculations. In *13th ETSF young researchers' meeting*, London, UK.
- 7 Zhou, J. S. & Reining, L. (2015c). Improved description of electron-plasmon coupling in Green's function calculations. In *APS March meeting 2015*, San Antonio, Texas.
- 8 Zhou, J. S. & Reining, L. (2014a). Improved description of electron-plasmon coupling in Green's function calculations. In *11th ETSF young researchers' meeting*, Rome, Italy.
- 9 Zhou, J. S., Rödl, C. & Reining, L. (2012). Exploring the performance of the cumulant expansion for the two-site hubbard model. In *9th ETSF young researchers' meeting*, Brussels, Belgium.