DR CLAUDE SIGOURNEY COX

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PROFILE

- Passionate data scientist within an environmental and regulatory chemistry context
- Six months experience within the Chemicals and Atmosphere Branch, Federal Department of Climate Change, Environment, Energy and Water
- Completed PhD in June 2024 on computational modelling of heavy metal removal from water using novel metal-organic frameworks

SKILLS

Technical Skills:

- Python: *machine learning, data scraping, data analysis and visualisation, data pipelines*
- Bash: *file handling, processing and generation*
- PowerBI: *plotting, relationships, basic DAX*
- R: *basic statistical tests, data visualisation*

General Skills:

- Excellent written and verbal communication skills
- Attention to detail
- Collaborative and team-focused personality
- Robust problem-solving skills
- Time and project management

EDUCATION

Degree	University	Outcome	Years
Ph.D. (Computational Chemistry)	UNSW	4 publications	2020-2024
B.Sc. Adv. (Chemistry and Physics)	UNSW	Hons 1. and 2 publications	2015-2019

EXPERIENCE

Department of Climate Change, Environment, Energy and Water 2024-2025 (current)

Scientific Programmer (initial)/Data Scientist (current)

- Managed data curation for the Australian Regulatory Chemical Informatics Engine (ARChIE)
  - Collated, validated and structured lists containing large volumes of chemical data to add 31 new lists and update 20 lists within the first 6 months with limited supervision
  - Independently managed consultation processes within the department for lists of high national regulatory significance
  - Developed new formal data governance policies for ARChIE data upload and maintenance
  - Worked closely with ARChIE stakeholders and users to ensure content relevance and value
  - Communicated the progress of ARChIE to the Branch through monthly update emails, which have received exemplary feedback from Branch head and other users
- Co-chaired the Chemicals Data Analysis Working Group (CDAWG) to develop branch data competency
  - Consulted with ARChIE and CDAWG community to redevelop the CDAWG SharePoint website and refine ARChIE training materials for new and less technical users
  - Delivered regular presentations on technical topics, such as ETL pipelines and data governance procedures, in a clear and accessible manner

- Provided detailed feedback on documents and scientific problems upon request, balancing providing this specialist advice with usual work
- Chaired and documented section meetings for five months, restructured agenda prior to handoff

University of New South Wales

PhD Candidate 2020-2024

- Conducted scientific research on a range of topics from mathematical descriptions of electron density to simulating heavy metal capture by novel materials
    - 5 total first author publications for PhD + honours, led calculations and manuscript writing
    - Presented oral talks at eight domestic and international conferences; Stranks award finalist at IC21 conference
- Synthesised various data sources and performed complex analysis on large datasets to produce reports and presentations for technical and non-technical stakeholders
- 5 years' experience working with a range of computational tools including coding languages, specialist computational chemistry software and HPC environments
- Proven ability to work both independently and in close collaboration with colleagues, effectively managing time, resources and expectations
- Mentored junior students in the School of Chemistry and assisted with writing and research

Casual Academic 2015-2022

- Developed leadership and management skills by mentoring Year 12 students and creating learning materials for two outreach programs **(2021)**
- Taught complicated scientific skills as a laboratory demonstrator, with an emphasis on safe laboratory practices and scientific precision (multiple courses, **2019-2022**)
- Tutored science and mathematics to students (high school to 2nd year university level, **2015-2021**)

Volunteering Experience 2021-2022

- Earned the first silver status in Australasia for our research group during the pilot of the Laboratory Efficiency Assessment Framework (LEAF) program **(2021)**
    - Liaised frequently with non-scientists on our implementation of sustainability practices
- Hands-on volunteer in a UNSW initiative (FoodHub) distributing free groceries to financially distressed students and community members during the COVID pandemic (**2021-2022)**
    - Efficiently assisted with the set-up of the space, distribution of food and pack-down each week, facilitating the provision of essential items to over 200 students per session

PUBLICATION LIST

1. Cox, C.S.: et al. Understanding the Role of Synthetic Parameters in the Defect Engineering of UiO-66: A Review and Meta-Analysis, Chemistry of Materials, **2023**,35(8), 3057-3072.
2. Cox, C.S.: et al. Computational Investigation of Adsorptive Removal of Pb^{2+} from Water by the UiO-66 Metal–Organic Framework: Comparison of Adsorption Sites on Defects and Functionalised Linkers,Australian Journal of Chemistry , **2021**, 75(2), 142-154.
3. Cox, C.S., et al. Computational Insights into As(V) Removal from Water by the UiO-66 Metal-Organic Framework. Journal of Physical Chemistry C, **2021**, 125 (5), 3157–3168.
4. Lloyd Williams O.H., Cox C.S.et al. Cation Induced Changes to the Structure of Cryptophane Cages by Ion Mobility-Mass Spectrometry. Dalton Transactions,**2024** ,53, 18473-18483.
5. Cox, C.S.; et al. Introducing Pseudoramps and Mixed Ramp-Gaussian Jensen Basis Sets for Better Nuclear Densities , Australian Journal of Chemistry, **2021**, 75 (2), 126-134.
6. Cox, C.S.; et al. Mixed ramp-Gaussian basis sets for core-dependent properties: STO-RG and STO-R2G for Li-Ne, Australian Journal of Chemistry, **2020**, 73(10), 911-922.