

# David Sinclair

University of Pittsburgh  
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I am a postdoctoral research associate in the Public Health Dynamics Laboratory and the Department of Health Policy and Management at the University of Pittsburgh. My research focuses on the creation and application of models and simulations, including models of the US opioid epidemic, the spread of influenza and the spread of measles. I am a key member of the team developing the agent-based modeling platform FRED. I completed my Ph.D. in Astrophysics at the University of Oxford, which provided me with a rigorous background in modeling complicated, large-scale systems, with mathematical and computational methods.

## Education

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**University of Oxford, UK** 2011–2015  
*Ph.D. Physics (Astrophysics)*

**University of Durham, UK** 2007–2011  
*Master of Physics (inc. undergraduate degree)*

## Research Experience

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**Graduate School of Public Health, University of Pittsburgh** **Pittsburgh, USA**  
*Postdoctoral Research Associate* 11/2016 – Present

My research focuses on the creation and application of models and simulations, including models of the US opioid epidemic and of infectious diseases. I am a core member of the team developing the Framework for Reconstructing Epidemiological Dynamics (FRED), an agent-based model platform.

**Sub-department of Astrophysics, University of Oxford** **Oxford, UK**  
*Ph.D. Student, Astrophysics* 10/2011 – 07/2015

I modeled the performance of a ground-breaking radio telescope using computational techniques. I applied statistical methods to interpret data and forecast performance in large parameter spaces.

## Teaching Experience

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**University of Pittsburgh** **Pittsburgh, USA**  
*Lecturer: Capstone Course* 2018-2019

Developing a lecture and assessment material for this final-year Masters in Public Health course. Lecture will be delivered twice a semester, three semesters a year. Lecture discusses modeling and simulation techniques.

**University of Pittsburgh** **Pittsburgh, USA**  
*Behavior Modeling Workshop* Oct 2018

Created and will teach a half-day workshop on agent-based models for attendees at a Modeling Behavior Conference and Workshop.

**Department of Physics, University of Oxford** **Oxford, UK**  
*Laboratory Instructor* 2012-2013

Taught data analysis and computing techniques to third-year students. Supervised groups of over twenty-five students with a range of abilities

## Publications

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Sinclair D., Burke D. S., Roberts M. S., and Jalal H. J. Contagiousness of the opioid epidemic. *Submitted*, 2018.

Sinclair D. and Albert S. M. Precautionary behavior and epidemic attack rate. *Submitted*, 2018.

Sinclair D., Dulwich F., Mort B., Jones M. E., Grainge K., and de Lera Acedo E. Effect of gain and phase errors on SKA1-low imaging quality from 50-600 MHz. *SKA Memo Series*, 153, 2014.

Price D. C., Sinclair D., Hickish J., and Jones M. E. Increased SKA-low science capability through extended frequency coverage. *SKA Memo Series*, 149, 2013.

Price D. C., Hickish J., Sinclair D., and Jones M. E. Optimal partitioning of SKA-low antenna elements. *SKA Memo Series*, 150, 2013.

Sinclair D., Krauland M., Grefenstette J., Galloway D.G., Frankeny B., Burke D.S., and Roberts M.S. Expected course of potential measles outbreaks in Texas. *In prep*, 2018.

## Published abstracts

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Sinclair D. and Albert S. M. The effect of fear on an epidemic's attack rate. *Models of Infectious Disease Agent Study (MIDAS) (poster)*, 2018.

Sinclair D. and Albert S. M. The effect of fear on an epidemic's attack rate. *University of Pittsburgh Postdoctoral Association annual symposium (poster)*, 2018.

Sinclair D. Jalal H. J., Roberts M. S., and Burke D. S. A dynamic disease transmission model of the opioid epidemic. *Society for Medical Decision Making (SMDM) (podium)*, 2017.

- Presentation featured in [The Economist](#), *Forecasting the opioid epidemic*, October 2017

Sinclair D., Dulwich F., Mort B., and Jones M. E. Beamforming for the Square Kilometre Array low frequency aperture array. *Royal Astronomical Society National Astronomy Meeting (poster)*, 2013.

## Awards and Funding

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### **Co-Investigator CDC contract (RFP ID: 75D30118R67887)**

*Advancing Analytics to Improve Actionable Changes in the Opioid Overdose Epidemic* 2018-2020  
\$1.5 million award to develop a modeling framework to investigate the dynamics of the US opioid epidemic

### **Pittsburgh Supercomputing Center (Grant ID BIO180020P)**

*Pittsburgh Research Computing Initiative Award* 2018  
52,000 CPU hours awarded for proposal *Modeling the Opioid Overdose Epidemic*.

### **Science and Technology Facilities Council**

*STFC CASE Scholarship - Doctoral* 2011-2015  
Awarded an enhanced Ph.D. scholarship covering full tuition, overheads and living expenses. Awarded for duration of Ph.D.

### **Durham University**

*Scientific Communication Prize* 2010  
Awarded a top prize in Durham University's Department of Physics annual poster competition.

## Computational Skills

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**Programming - Expert** Python, Matlab, LabVIEW, Simulink.

**Programming - Intermediate** R, C++

**Expert** Linux (operating system), LaTeX (scientific publishing)

## Academic Presentations

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**2018** Health Sciences Library System, University of Pittsburgh

**2018** Public Health Dynamics Research Meeting, University of Pittsburgh

**2018** Modeling Behavior Conference and Workshop, University of Pittsburgh (Poster, to be presented)

**2018** Modeling Infectious Disease Agent Study (MIDAS) annual meeting, Bethesda (Poster)

**2018** University of Pittsburgh Postdoctoral Association Symposium (Poster)

**2017** Society for Medical Decision Making, annual North American meeting

**2017** Public Health Dynamics Research Meeting, University of Pittsburgh

**2014** Square Kilometre Array Research Group, University of Oxford

**2013** Graduate Student Seminar, University of Oxford

**2013** National Astronomy Meeting, University of St. Andrew's (Poster)

## Other Vocational Experience

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### **Dehns, Oxford**

*Junior Patent Attorney*

*Sep 2015 – Oct 2016*

- Critically interpreted, characterized and presented technical features of diverse fields encompassing computing, engineering and science, including health care
- Rapidly achieved comprehensive knowledge of emerging and unfamiliar technology
- Effectively communicated nuanced technical data to specialist and lay audiences
- Gained extensive knowledge of intellectual property and commercialization processes relating to university research

### **Department of Physics, Durham University**

*Website Developer*

*Jul 2010 – Sep 2010*

- Designed and created website for a new research group
- Produced comprehensive staff handbook and postgraduate recruitment material to promote the group
- Independently devised and realized all aspects of the project
- Interfaced between researchers and departmental media office

## Outreach Work

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### **Astronomy on Tap Pittsburgh**

*Volunteer*

**Pittsburgh, USA**

*2017-Present*

Astronomy on Tap brings astrophysics to the adult public via short talks in a relaxed setting.

### **Department of Physics, University of Oxford**

*Public Outreach Volunteer*

**Oxford, UK**

*2012-2016*

Helped organize and run events inside and outside of the department to increase scientific literacy, reaching thousands of children and adults each year.

## Languages

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- **English:** Native
- **French:** Basic

## References

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### **Mark Roberts**

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### **Donald Burke**

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### **Hawre Jalal**

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