

# Robert Andrew Spencer

## PERSONAL DATA

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ADDRESS | 23 St. Peter's Street; Cambridge; CB3 0BD  
EMAIL | [career@robertandrewspencer.com](mailto:career@robertandrewspencer.com)  
GITHUB | [rspencero1](https://github.com/rspencero1)  
ORCID | 0000-0003-2432-3392

## SELECTED WORK EXPERIENCE

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2022 – NOW | **Quantitative Analyst**  
— [Squarepoint Capital](#)

2018 – 2023 | **Teaching**  
— [DPMMS Cambridge](#)  
Undergraduate Supervisions

2022 | **Science Communication Intern**  
— [The Naked Scientists](#)  
Radio and Podcasting  
*Journalism | presentation | production*

2017 | **Software Development Intern**  
— [Facebook \(now Meta\)](#)  
Android UI Systems ([Litho](#))  
*Library performance profiling | open-sourcing operations | repository manipulation and secret removal | sample Android project development (conception to implementation)*

2015 | **Software Development Intern**  
— [Amazon Web Services](#)  
Placement team  
*Fault detection and monitoring | wrote and documented service in ruby | integrated with S3 and alert tools | deployed through CI across multiple data centres*

2013 | **Contract Software Developer**  
— [InterMet South Africa](#)  
Meteorological DBMS development  
*Code refactoring | on-site debugging and development*

## EDUCATION

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2023 | PhD in Pure Mathematics  
at the [University of Cambridge](#) to be conferred July 2023.

2018 | MAST in Pure Mathematics  
from [University of Cambridge](#) awarded with distinction.

2016 | B.Sc. (Hons) (Mathematics)  
from [University of Cape Town](#) awarded first class.

2015 | B.Sc. (Mathematics, Applied Mathematics and Physics)  
from [University of Cape Town](#) awarded with distinction  
in *Applied Mathematics, Mathematics, Physics and the degree with distinction.*

## COMPUTER SKILLS

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My daily driver is Ubuntu Linux and I write most of my current personal projects using Rust or Python. In previous employment I have used:

LANGUAGES | Rust, Python, C, SQL, HTML, CSS, Java, bash, Delphi Pascal, Mathematica, KDB/q  
SKILLSETS | Algorithm design/analysis, system administration, embedded development  
APPLICATIONS | git,  $\LaTeX$ , Adobe Audition

## PUBLICATIONS AND PREPRINTS

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- 2022 **Cell Modules for type  $A$  Webs** — under consideration  
*We examine the cell modules for the category of type  $A_n$  webs and their natural cellular forms. We calculate the Gram determinant of these forms and prove a conjecture due to Elias.*  
Stuart Martin and R. A. Spencer [arXiv:2210.09639](#)
- $(\ell, p)$ -Jones-Wenzl Idempotents** — Journal of Algebra 603  
*We extend the results of Burrull, Libedinsky and Sentinelli to determine the idempotents describing the projective cover of the trivial Temperley-Lieb module in mixed characteristic.*  
Stuart Martin and R. A. Spencer [10.1016/j.jalgebra.2022.03.022](#)
- 2021 **Non-induced Modular Representations of Cyclic Groups** — under consideration  
*We compute the ring of non-induced representations for a cyclic group,  $C_n$ , over a field and show that it has rank  $\varphi(n)$  — regardless of the characteristic of the field.*  
Liam Jolliffe and R. A. Spencer [arXiv:2108.10011](#)
- Modular Valenced Temperley-Lieb Algebras**  
*We determine the structure and representation theory of certain valenced Temperley-Lieb algebras by studying their cellular data in positive and mixed characteristic.*  
R. A. Spencer [arXiv:2108.10011](#)
- 2020 **The Modular Temperley-Lieb Algebra** — to appear Rocky Mountain Journal of Mathematics  
*We study diagrammatic representations of the Temperley-Lieb algebras over positive characteristic to derive the decomposition numbers and the dimensions of simple modules.*  
R. A. Spencer [arXiv:2011.01328](#)

## SELECTED EXTRA-CURRICULAR RESPONSIBILITIES

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- 2019 – 2021 Captain, Cambridge University Bowmen
- 2014 – 2016 South African International Olympiad in Informatics Team Coach  
*Team leader 2016; Deputy team leader 2014–2015*
- 2012 – 2016 Staff at Electronics Base, Cederberg Senior Scout Adventure  
*Base leader 2014, 2016*

## COMPETITIONS AND OLYMPIADS

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- 2012, 2013 International Olympiad in Informatics  
*Bronze medal 2013*
- 2011, 2012 International Mathematics Olympiad  
*Honourable mentions*
- 2016, 2017 NSUCRYPTO International Students' Olympiad in Cryptography  
*Winner 2016; runner-up 2017*
- 2015, 2016 ACM International Collegiate Programming Contest  
*National team*
- 2013, 2014 International Mathematics Competition  
*Second prize 2014; honourable mention 2013*
- 2009 – 2012 South African Computer Olympiad  
*Winner 2012; Bronze medal 2010–2011; top ten 2009*
- 2009, 2012 South African Mathematics Olympiad  
*Winner 2009; Runner-up 2012*
- 2008 – 2012 UCT Mathematics Competition  
*Winner 2008, 2012; top ten 2009–2011*
- 2014 – 2016 Standard Bank IT Challenge  
*Winning national team 2015, 2016; winning provincial team 2014*
- 2013 South African Tertiary Mathematics Olympiad  
*Winner*

## INTERESTS AND ACTIVITIES

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Archery; Recreational programming; Reading; Electronics; Hiking; Terrarium building; D&D