

AFFIDAVIT OF PROFESSOR PENNY DIANE SACKETT
5 AUGUST 2021

COURT DETAILS

Court	The Land and Environment Court of NSW
Division	Class 4
Registry	Level 4, 225 Macquarie Street, Sydney
Case number	20/106678

TITLE OF PROCEEDINGS

Applicant	Bushfire Survivors for Climate Action Incorporated (INC1901160)
Respondent	Environment Protection Authority (ABN 43 692 285 758)

FILING DETAILS

Filed for	Bushfire Survivors for Climate Action Incorporated, Applicant
Legal representative	Elaine Johnson, Environmental Defenders Office Ltd
Legal representative reference	1926923
Contact name and telephone	Elaine Johnson; Matt Floro; (02) 9262 6989
Contact email	elaine.johnson@edo.org.au; matthew.floro@edo.org.au

FB PB

AFFIDAVIT

Name Professor Penny Diane Sackett
 Address Penny D Sackett Strategic Advisory Services
 1/6 Hobson Place, Ainslie ACT 2602
 Occupation Strategic Scientific Advisor and Principal, Penny D Sackett Strategic
 Advisory Services; Distinguished Honorary Professor, Institute for Climate,
 Energy and Disaster Solutions, Australian National University
 Date 5 August 2021

I affirm:

Professional background

- 1 My professional background is set out in my affidavit affirmed on 5 March 2021
 (**First Sackett Affidavit**).

My further supplementary expert report

- 2 I have been asked by the Applicant in these Proceedings to prepare a further
 supplementary expert report that addresses the following question:

*Since the date of the Second Sackett Affidavit and having regard to the Third
 Fowler Affidavit and the Third EPA Tender Bundle, has your opinion changed
 on any of the matters 1 to 6 in the amended areas of expert evidence
 annexed as "A1" to the orders of Moore J dated 26 October 2020, and, if so,
 how?*

- 3 In response, I have prepared the further supplementary expert report dated 4 June
 2021 (**Third Sackett Report**), which is annexed to this Affidavit and marked '**PDS-
 FS1**'.
- 4 The views expressed in the Third Sackett Report are my own and correctly state
 my opinion in relation to the matters set out in the Third Sackett Report. I believe no
 further qualifications are required as to the opinions set out in the Third Sackett
 Report other than those expressed in the Third Sackett Report.
- 5 I have been provided with a copy of Division 2 of Part 31 of the *Uniform Civil
 Procedure Rules 2005 (UCPR)* and the *Expert Witness Code of Conduct (Code)* in
 Schedule 7 of the UCPR. I believe that the Third Sackett Report complies with the
 Code.

FB pb

- 6 I believe that the information set out in this Affidavit is true and correct to my own knowledge.

4B pb

AFFIRMED at

Turner ACT

Signature of deponent

Name of witness

Frances Bradshaw

Address of witness

21 Barry Drive, Turner ACT 2612

Capacity of witness

Legal practitioner

And as a witness, I certify the following matters concerning the person who made this affidavit (the **deponent**):

- 1 #I saw the face of the deponent. [OR, delete whichever option is inapplicable]
~~#I did not see the face of the deponent because the deponent was wearing a face covering, but I am satisfied that the deponent had a special justification for not removing the covering.*~~
- 2 ~~#I have known the deponent for at least 12 months. [OR, delete whichever option is inapplicable]~~
 #I have confirmed the deponent's identity using the following identification document:

ACT Driver Licence No. 5177474

Identification document relied on (may be original or certified copy)[†]

Signature of witness

Note: The deponent and witness must sign each page of the affidavit. See UCPR 35.7B.

[* The only "special justification" for not removing a face covering is a legitimate medical reason (at April 2012).]

[[†] "Identification documents" include current driver licence, proof of age card, Medicare card, credit card, Centrelink pension card, Veterans Affairs entitlement card, student identity card, citizenship certificate, birth certificate, passport or see [Oaths Regulation 2011](#) or refer to the guidelines in the NSW Department of Attorney General and Justice's "[Justices of the Peace Handbook](#)" section 2.3 "Witnessing an affidavit" at the following address: <http://www.jp.nsw.gov.au/Documents/jp%20handbook%202014.pdf>]

FB

Further Supplementary Expert Report to the NSW Land and
Environment Court
in the matter of
Bushfire Survivors for Climate Action Incorporated
(INC1901160)
v
Environment Protection Authority
(NSWLEC proceedings 2020/00106678)

Submitted by Professor Penny D Sackett
Strategic Advisory Services

5 August 2021

This is the document referred to as ^{Amexare} 'PDS-FS1'
in the affidavit of Professor Penny Diane Sackett
affirmed at ~~Furber~~ on 5 August 2021 before me:



5/08/21

FRANCES BRADSHAW
Solicitor of the
ACT Supreme Court

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1 Preliminaries

- 1) This independent, further supplementary expert report (hereafter, 'this Third Sackett Report') is submitted to the Land and Environment Court of NSW (hereafter, 'the Court') as a response to a further supplementary expert brief provided to me by Environmental Defenders Office (EDO) on 2 August 2021 (hereafter, 'the Further Supplementary Brief'). The Further Supplementary Brief is annexed to this Third Sackett Report as Appendix A.
- 2) I understand that this Third Sackett Report will serve as expert evidence in a matter before the Court (NSWLEC proceedings 2020/00106678), in which the EDO is acting for Bushfire Survivors for Climate Action Incorporated (INC1901160) in a matter against the NSW Environment Protection Authority (EPA).
- 3) I have reviewed Division 2 of Part 31 of the *Uniform Civil Procedure Rules 2005* (UCPR) and the Expert Witness Code of Conduct, which govern the use of expert evidence in NSW Courts, and I agree to be bound by their terms.
- 4) I have read the orders made by Moore J on 26 October 2020, including its Annex A1 laying out the Amended Areas of Expert Evidence (see Appendix B). These areas were explicitly addressed in my expert report to the Court dated 5 March 2021 (hereafter, 'the First Sackett Report'), which included consideration of the affidavit of David Fowler dated 28 August 2020 (hereafter, 'the First Fowler Affidavit,') and the associated Tender Bundle served on the same date (hereafter, 'the First EPA Tender Bundle').
- 5) I affirmed an affidavit on 5 March 2021 in these proceedings that included the First Sackett Report.
- 6) Subsequently, I prepared a supplementary expert report dated 4 June 2021 (hereafter 'the Second Sackett Report'), which included consideration of the affidavit of David Fowler dated 30 April 2021 (hereafter, 'the Second Fowler Affidavit,') and the associated Tender Bundle served on the same date (hereafter, 'the Second EPA Tender Bundle').
- 7) I affirmed an affidavit on 4 June 2021 in these proceedings that included the Second Sackett Report.

- 8) The Further Supplementary Brief provided to me by the EDO requested that I prepare this Third Sackett Report to address the following question:

Since the date of the Second Sackett Affidavit and having regard to the Third Fowler Affidavit and the Third EPA Tender Bundle, has your opinion changed on any of the matters 1 to 6 in the amended areas of expert evidence annexed as "A1" to the orders of Moore J dated 26 October 2020, and, if so, how?

- 9) I have read the affidavit of David Fowler dated 29 July 2021 (hereafter, 'the Third Fowler Affidavit'), and considered the associated Tender Bundle served on the same date (hereafter, 'the Third EPA Tender Bundle').
- 10) This Third Sackett Report answers the question posed to me in above paragraph 8) considering the material in paragraph 9) and should be read in conjunction with the First Sackett Report and the Second Sackett Report.
- 11) A brief list of my relevant qualifications and experience is attached as Appendix C to this Third Sackett Report.

2 Executive Summary

- 12) In this Third Sackett Report, I provide my assessment of the documents mentioned in the Third Fowler Affidavit and presented in the Third EPA Tender Bundle, with respect to the questions posed in the Amended Areas of Expert Evidence evidence annexed as "A1" to the orders of Moore J dated 26 October 2020 (section 3), with particular emphasis on the sixth of these questions.
- 13) The consequence is that with respect to the question posed to me in the Supplementary Brief (refer to above paragraph 8), **my opinion has not changed on any of the matters 1 to 6 in the Amended Areas of Expert Evidence annexed as "A1" to the orders of Moore J dated 26 October 2020.**

3 Consideration of the Third EPA Tender Bundle

14) The portions of the Third Fowler Affidavit relevant to the question posed to me (refer paragraph 8) in the Supplementary Brief are **paragraphs 3 and 4 of that Affidavit**, which introduce the three documents included in the Third EPA Tender Bundle, namely the:

- a) **EPA Regulatory Strategy** (Tab 1 of the EPA Third Tender Bundle);
- b) **EPA Strategic Plan** (Tab 2 of the EPA Third Tender Bundle); and
- c) **NSW Waste and Sustainable Materials Strategy** (Tab 3a of the EPA Third Tender Bundle) and an associated website (at Tab 3b).

My comments on the Third Fowler Affidavit are thus confined to an assessment of these documents, in accordance with the question posed in paragraph 8).

3.1 *EPA Regulatory Strategy 2021-24*

15) The document at Tab 1 of the Third EPA Tender Bundle, EPA Regulatory Strategy 2021-24, appears to be a finalised version of a draft document supplied at Tab 2b in the Second EPA Tender Bundle. Consequently, an earlier draft version of this document was assessed in the Second Sackett Report.

16) I have read the revised and final version of the EPA Regulatory Strategy 2021-24, noting several small revisions between the final and draft versions, including removal in the final document of a statement attributing the primary cause of changing climatic conditions to “fossil fuel emissions around the world.”¹

17) Consideration of the final EPA Regulatory Strategy 2021-24 does not alter my opinion on any of the matters 1 to 6 in the amended areas of expert evidence annexed as “A1” to the orders of Moore J dated 26 October 2020.

¹ See page 13 of the EPA draft Regulatory Strategy, presented as Tab 2b in the Second EPA Tender Bundle.

3.2 EPA Strategic Plan

- 18) Tab 2 of the EPA Third Tender Bundle contains what I understand to be a final version of the EPA Strategic Plan, entitled Strategic Plan 2021-24. A previous strategic plan, entitled EPA Strategic Plan 2017-21 (2018 updated), was included in the First EPA Tender Bundle at Tab 77, and was thus assessed as part of the First Sackett Report.
- 19) I have read the EPA Strategic Plan 2021-24. Unlike its predecessor, this most recent strategic plan mentions climate change. The plan states without detail, *inter alia*, that the EPA takes “action to reduce emissions . . . aligned with the principles in the NSW Net Zero Plan.” I understand the NSW Net Zero Plan referred to in this context to be NSW Department of Planning, Industry and Environment document Net Zero Plan Stage 1: 2020-2030, provided at Tab 165 of the First EPA Tender Bundle, and thus considered in the First Sackett Report.
- 20) Consideration of the EPA Strategic Plan 2021-24 does not alter my opinion on any of the matters 1 to 6 in the amended areas of expert evidence annexed as “A1” to the orders of Moore J dated 26 October 2020.

3.3 NSW Waste and Sustainable Materials Strategy

- 21) The document entitled NSW Waste and Sustainable Materials Strategy 2041 (Stage 1: 2021-2027) is presented at Tab 3a of the EPA Third Tender Bundle, and its associated website² given at Tab 3b. The document is authored by the NSW Department of Planning, Industry and Environment, and updates the previous NSW Waste Avoidance and Resource Recovery Strategy 2014-2021, which formed part of the First EPA Tender Bundle at Tab 189, which was considered in the First Sackett Report.
- 22) I have read the NSW Waste and Sustainable Materials Strategy 2041 (Stage 1: 2021-2027) and its associated website. Targets are set out on page 6 of the strategy, some of which, if met, may indirectly reduce greenhouse gas emissions through reduction of waste and reuse of materials in a relative sense (that is, relative to an absence of such a strategy).

² <https://www.dpie.nsw.gov.au/our-work/environment-energy-and-science/waste-and-sustainable-materials-strategy/reducing-carbon-emissions>

23) However, consideration of the NSW Waste and Sustainable Materials Strategy 2041 (Stage 1: 2021-2027) does not alter my opinion on any of the matters 1 to 6 in the amended areas of expert evidence annexed as "A1" to the orders of Moore J dated 26 October 2020.

4 Conclusion

24) I have examined the Third Fowler Affidavit and Third EPA Tender Bundle. The materials therein were judged to be relevant only to area six of Amended Areas of Expert Evidence as outlined in the Annex A1 of Moore J's order of 26 October 2020, namely whether or not (and why) the objectives, guidelines and policies of the NSW EPA:

- a) regulate or reduce direct and indirect sources of greenhouse gas emissions in a manner consistent with global temperature rise limited to 1.5°C from pre-industrial levels, and
- b) are fit for purpose in protecting or mitigating against the threat posed by climate change to the quality of the environment and the people of New South Wales.

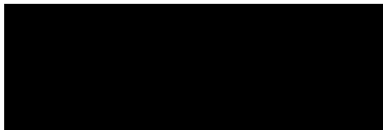
25) Using the interpretations given in paragraphs 265), 282) and 286) of the First Sackett Report, and taking into consideration the analysis presented in the First Sackett Report and the Second Sackett Report, together with the documents presented in the tender bundles supplied by the EPA, I conclude that:

- a) the documents in the First, Second and Third EPA Tender Bundles do not regulate or reduce direct and indirect sources of greenhouse gas emissions in a manner consistent with global temperature rise being limited to 1.5°C from pre-industrial levels, and
- b) the objectives, guidelines and policies identified by the NSW EPA in the First, Second and Third EPA Tender Bundles are not fit for purpose in protecting or mitigating against the threat posed by climate change to the quality of the environment and the people of New South Wales.

26) Consequently, with respect to the question posed to me in the Supplementary Brief (refer to paragraph 8), since the date of the Second Sackett Affidavit and having regard to the Third Fowler Affidavit and the Third EPA Tender Bundle, my opinion has not changed on

any of the matters 1 to 6 in the amended areas of expert evidence annexed as "A1" to the orders of Moore J dated 26 October 2020.

Respectfully submitted on 5 August 2021,

A solid black rectangular box used to redact the signature of Professor Penny D Sackett.

Professor Penny D Sackett

**Appendix A: Further Supplementary Brief dated 2 August 2021
Provided to me by the EDO**

See attached pages.



Environmental Defenders Office

2 August 2021

Professor Penny D Sackett
Penny D Sackett Strategic Advisory Services

By email: pd.sackett@gmail.com

CONFIDENTIAL AND PRIVILEGED

Dear Professor Sackett

Bushfire Survivors for Climate Action Incorporated (INC1901160) v Environment Protection Authority (NSWLEC proceedings 2020/00106678) (Proceedings)

1. We refer to the expert brief dated 10 November 2020 (**Original Expert Brief**) in relation to the Proceedings.
2. We note that you:
 - a. affirmed an affidavit on 5 March 2021 enclosing an expert report dated 5 March 2021 (**First Sackett Affidavit**) that directly responded to the amended areas of expert evidence in Annex "A1" of the orders of Moore J dated 26 October 2020 (**enclosed**); and
 - b. affirmed an affidavit on 4 June 2021 enclosing an expert report dated 4 June 2021 (**Second Sackett Affidavit**) in response to an expert brief dated 14 May 2021.
3. On 29 July 2021, the Respondent served the Applicant with an affidavit of David Fowler affirmed 29 July 2021 (**Third Fowler Affidavit**) (**enclosed**) and a tender bundle (**Third EPA Tender Bundle**) (**enclosed**).
4. This further supplementary brief constitutes a formal brief in relation to the Third Fowler Affidavit and Third EPA Tender Bundle.

Overview of the Further Supplementary Work Required

5. We note that:
 - a. the background to the matter and your duty to the Court are outlined at [1] to [19] of the Original Expert Brief; and
 - b. the expert report requirements are outlined at [24] to [28] and the fees and terms and duty of confidentiality are outlined at [31] to [35] of the Original Expert Brief.
6. The further supplementary work we require involves the following:
 - a. review any relevant documentation;

- b. prepare a further supplementary written expert report that conforms with the Code of Conduct; and
 - c. appear as an expert witness in the Court, if required.
- 7. Please prepare an independent expert report that addresses the following question:

Since the date of the Second Sackett Affidavit and having regard to the Third Fowler Affidavit and the Third EPA Tender Bundle, has your opinion changed on any of the matters 1 to 6 in the amended areas of expert evidence annexed as “A1” to the orders of Moore J dated 26 October 2020, and, if so, how?
- 8. We request that you provide us with a draft of your report for review before finalising it. We emphasise that the purpose of this is not to influence the conclusions or recommendations you make but to ensure that the language and expression of the report is clear and complies with the formal legal requirements of an expert report.
- 9. Please let us know as soon as possible if you require further information for the purpose of giving your expert opinion.

Relevant Documents

- 10. In addition to the relevant documents provided to you in the Original Expert Brief, we now **enclose** the following documents for your consideration:
 - a. Third Fowler Affidavit; and
 - b. Third EPA Tender Bundle.

Timing

- 11. The final hearing of the Proceedings is scheduled for **9 to 11 August 2021**.
- 12. Therefore, we would be grateful if you could please send us a draft of your further supplementary expert report **by Wednesday, 4 August 2021**.
- 13. If you would like to discuss this further supplementary brief further, please contact the author on (02) 9262 6989 or email matthew.floro@edo.org.au.

14. We are grateful for your assistance in this matter.

Yours sincerely

Environmental Defenders Office



Matt Floro
Senior Solicitor

Our Ref: 2027737

Appendix B: Amended Areas of Expert Evidence

See attached page.

ANNEX A TO THE FURTHER AMENDED NOTICE OF MOTION

Amended aAreas of expert evidence

1. Unregulated release of greenhouse gases is the greatest threat to the environment and people of NSW, as anthropogenic climate change has the potential to adversely and irreversibly alter all aspects of the natural environment.
2. To what extent have anthropogenic greenhouse gas emissions caused a long-term increase in extreme fire weather and in the length of the fire season, across Australia and how that would impact on the environment of New South Wales.
3. Whether and why the world is or is not on target to achieve a global temperature rise of no more than 1.5 degrees Celsius above pre-industrial levels and how that would impact on the environment of New South Wales.
4. Whether and why the current emissions reduction trajectory for Australia is or is not in line with and appropriate to limiting global temperature rise to no more than 1.5 degrees Celsius above pre-industrial levels and how that would impact on the environment of New South Wales.
5. Whether and why the current emissions reduction trajectory for New South Wales is or is not in line with and appropriate to limiting global temperature rise to no more than 1.5 degrees Celsius above pre-industrial levels and how that would impact on the environment of New South Wales.
6. Whether or not (and why) the objectives, guidelines and policies identified by the Respondent:
 - (a) regulate or reduce direct and indirect sources of greenhouse gas emissions in a manner consistent with global temperature rise being limited to 1.5 degrees Celsius from pre-industrial levels; and
 - (b) are fit for purpose in protecting or mitigating against the threat posed by climate change to the quality of the environment and the people of New South Wales.

Appendix C: Curriculum Vitae of Author

See attached pages.

Curriculum Vitae
PENNY D. SACKETT

Academic Address:

Climate Change Institute
Australian National University
Frank Fenner Building, Linnaeus Way
Canberra, ACT 2601
Penny.Sackett@anu.edu.au

Private Business Address:

Dr Penny D Sackett
Strategic Advisory Services

www.pennysackett.com

Born: 28 February 1956, Lincoln, Nebraska USA

Citizenship: U.S. and Australian

Permanent Residence: Australia

Languages: English: Mother Tongue; Dutch: Good knowledge; Spanish: Beginner's knowledge

Education:

- 1984 Ph.D. in Physics, University of Pittsburgh, PA, USA
Thesis Title: *Scale Parameters for Finite Temperature Actions of Lattice Gauge Theories Coupled to Fermions*
- 1980 M.S. in Physics, University of Pittsburgh, PA, USA
- 1978 B.S. in Physics, University of Nebraska-Omaha (UNO), NE, USA
- 1978 Teaching certification (K-12), Physics and Mathematics, UNO, USA

Distinctions and Honours:

- 2019 Distinguished Alumni Award, University of Pittsburgh, USA
- 2016 Omaha (USA) North High Magnet School "Viking of Distinction" Award
- 2014 UNO College of Arts and Sciences Outstanding Alumni Award
- 2014 Citation for Alumni Achievement: University of Nebraska-Omaha (UNO)
- 2011 Opening Keynote Speaker: 2011 Adelaide Festival of Ideas, SA, Australia
- 2005 Univ of Canberra-Australian National Univ International Women's Day Lecturer
- 2004 Finalist, Telstra ACT Business Women of the Year, ACT, Australia
- 2003 Fellow of the UK Royal Astronomical Society
Election to the Society to honour a person eminent in the field of astronomy and not normally resident in the UK for leadership, enabling activities, etc
- 2002 Harley Wood Lecturer, Astronomical Society of Australia
- 2000 Athena Lecturer, St. Andrews University, Scotland
- 1998 University of Groningen Teaching Award (Onderwijsprijs), The Netherlands
- 1992-1994 J. Seward Johnson Fellow, Institute of Advanced Study, Princeton, NJ, USA
- 1981-1982 O.H. Blackwood Award for Excellence in Teaching, University of Pittsburgh, PA, USA
- 1979-1981 Andrew Mellon Fellowship, University of Pittsburgh, PA, USA
- 1978 Summa Cum Laude, University of Nebraska-Omaha, NE, USA
- 1978 Most Outstanding Physics Student, University of Nebraska-Omaha, NE, USA
- 1978 Most Outstanding Mathematics Student, University of Nebraska-Omaha, NE
- 1974-1978 Dean's List, University of Nebraska-Omaha, NE, USA
- 1974-1978 Nebraska Regent's Scholarship, University of Nebraska-Omaha, NE, USA
- 1974-1978 National Merit Scholarship, University of Nebraska-Omaha, NE, USA

Professional Society Membership

Astronomical Society of Australia
International Astronomical Union
Royal Astronomical Society

Professional Activity and Appointments

2020-current	Distinguished Honorary Professor (E3), Climate Change Institute, Australian National University, Canberra, Australia <i>Community engagement, climate science synthesis and communication</i>
2011-current	Strategic Scientific Advisor and Principal Penny D Sackett Strategic Advisory Services <i>Sole trader assisting governments, business and other organizations with matters of science and sustainability</i>
2014-2019	Honorary Professor, Climate Change Institute, Australian National University, Canberra, Australia <i>Community engagement, science for policy, subnational climate change action</i>
2008-2014	Academic Adjunct Professor, Research School of Astronomy and Astrophysics, Australian National University, Canberra, Australia <i>Mentoring early career researchers</i>
2008-2011	Chief Scientist for Australia, DIISR, Australian Commonwealth Government, Canberra, Australia <i>Provision of independent, whole-of-government scientific advice, science advocacy, liaison with community, bureaucracy and state governments</i>
2007-2008	Professor (Level E2), Research School of Astronomy and Astrophysics, Australian National University (ANU), Canberra, Australia <i>Research, research training, and international research co-ordination</i>
2002-2007	Director, Research School of Astronomy and Astrophysics, and the Mt. Stromlo and Siding Springs Observatories, ANU, Canberra, Australia <i>Strategic leadership, budget, human & facility management, liaison, advocacy</i>
2001-2002	Chaired Professor of (Extra)Galactic Optical/Infrared Astronomy, Kapteyn Astronomical Institute, University of Groningen, The Netherlands <i>Research, research training, teaching, international program building</i>
1998-2000	Associate Professor with tenure (Universiteits Hoofd Docent), Kapteyn Astronomical Institute, University of Groningen, The Netherlands <i>Research, research training, teaching, international program building</i>
2000	Visiting Member, Institute for Advanced Study, Princeton, NJ, USA (on leave from Kapteyn Institute 1999-2000 academic year) <i>Research of international standing</i>
1999	Visiting Scientist, Anglo-Australian Observatory, Epping, Australia (on leave from Kapteyn Institute 1999-2000 academic year) <i>Research of international standing and international co-ordination</i>
1995-1997	Assistant Professor with tenure (Universiteits Docent), 75% full time Kapteyn Astronomical Institute, University of Groningen, The Netherlands <i>Research, research training, teaching, research program building</i>
1995-1997	Visiting Research Member, School of Natural of Sciences, 25% full time Institute of Advanced Study, Princeton, NJ, USA <i>Research of international standing</i>
1992-1994	Research Member & J. Seward Johnson Fellow, School of Natural of Sciences, Institute of Advanced Study, Princeton, NJ, USA <i>Self-directed research of international standing</i>

1991-1992	Program Director, Education, Human Resources and Special Programs, Div of Astronomical Sciences, National Science Foundation, Washington, DC, USA <i>Program management, cross-division initiatives, external liaison</i>
1990-1992	Research Assistant Professor, Physics and Astronomy Department, University of Pittsburgh, PA, USA <i>Self-directed research</i>
1987-1990	Adjunct Assistant Professor, Physics and Astronomy Department, University of Pittsburgh, PA, USA <i>Self-supported research post</i>
1988-1989	Visiting Scientist, Kapteyn Astronomical Institute, University of Groningen, The Netherlands <i>Self-directed independent research</i>
1987	Scientific Writing Consultant, Pittsburgh Supercomputing Center (PSC), Pittsburgh, PA, USA <i>Technical writing and editing</i>
1986-1987	Research Associate, Biological Sciences Department, University of Pittsburgh, PA, USA <i>Algorithm development and application to cellular activity</i>
1985-1986	Visiting Assistant Professor, Physics and Astronomy Department, University of Pittsburgh, PA, USA <i>University physics teaching</i>
1983-1985	Visiting Assistant Professor, Physics Department, Amherst College, MA, USA <i>University teaching in liberal arts setting</i>
Summer 1983	Science Writer Intern, <i>Science News Magazine</i> , Washington, DC, USA <i>Developing and writing science news stories</i>

Supervision of Junior Researchers

Researcher name	Sackett Supervisory Capacity	Subsequent posting
Paul Vreeswijk	1997 Honours Thesis Supervisor	Fellow, Weizmann Inst of Science, IL
Jean Philippe Beaulieu	1996-98 Postdoctoral Supervisor	Director of Research, IAP, Paris, FR
Martin Dominik	1997-99 Postdoctoral Supervisor	Reader, Univ of St Andrews, UK
Richard Naber	PhD Thesis (Co-supervisor)	Left field before completion
Scott Gaudi	2001 PhD Thesis (Co-supervisor)	Professor, Ohio State University, USA
Eduard Westra	2003 Honours Thesis Supervisor	Industrial Data Analyst, NL
Ulyana Dyudina	2004 Postdoctoral Supervisor	Assoc Scientist, Space Science Inst, USA
Jelte de Jong	2005 PhD Thesis (Co-supervisor)	Researcher, University of Groningen, NL
David Weldrake	2005 PhD Thesis Supervisor	Asst Director, M-D Basin Authority, AU
Brandon Tingley	2006 PhD Thesis Supervisor	PostDoc, Aarhus University, DK
Christine Thurl	2007 PhD Thesis Supervisor	Industrial Physicist, DE
Thomas Evans	2008 Honours Supervisor	Research Fellow, Univ of Exeter, UK
Daniel Bayliss	2009 PhD Thesis Supervisor	Asst Professor, Univ of Warwick, UK
Karen Lewis	2011 PhD Thesis (Co-supervisor)	Postdoc, Earth Life Science Inst, JP

Selected Major Experiences and Accomplishments

- 2015-present *As Councillor and Chair of ACT Climate Change Council:*
- Spearheaded recommendation for interim GHG emissions targets in the ACT
 - With Prof. Will Steffen, introduced carbon budget approach into ACT policy-making
 - Led *Canberra's Climate-Fuelled Summer of Crisis* Report
- 2011-present *As Private Strategic Scientific Advisor:*
- Foresight analyst for 2025 Strategic Plan of BASF, world's largest chemical producer
 - Scientific Assessor for Queensland \$20m Smart Futures Fund
 - Analyst and advisor to Australian multi-state Climate Action Roundtable
 - Facilitator for ACT Government Climate Change Adaptation Needs Workshop
- 2008-2011 *As Chief Scientist for Australia:*
- Commissioned four cross-disciplinary reports for Prime Minister's Council (PMSEIC):
Challenges at energy-water-carbon intersections
Australia and food security in a changing world
Transforming learning and the transmission of knowledge
Epidemics in a changing world
 - Founded Forum of Australian Chief Scientists
 - Established two-way communication tools with Australian community
- 2002-2007 *As Director, Research School of Astronomy and Astrophysics (RSAA)*
- Managed University department and observatory staff of 100
 - Responsible for annual budget of 6M AUD plus 4M AUD in 2nd & 3rd stream funds
 - Oversaw rebuild of main campus of School after devastating 2003 bush fires
 - Led national effort to establish next generation telescope access for Australia
 - Established ANU Planetary Science Institute, joint venture with ANU Earth Sciences
 - Initiated and carried out large change process at RSAA, managing mandated 29% increase in salary costs & 20% reduction in recurrent budget
 - Spearheaded entry into two major international partnerships:
Giant Magellan Telescope (GMT) and Murchison Wide Field Array (MWA)
 - Negotiated awards of two major instrument contracts: Gemini NIFS (II) and GSAOI
 - Oversaw 80% increase in research publication rate, 50% growth in PhD student body, and increase in student completion rate while decrease in time to submission
- 1989-2010 *As Scientific Researcher and Team Leader in USA, NL and Australia:*
- Streamlined massive searches for transiting planets in the Milky Way
 - Founded and Principal Investigator of the international PLANET Collaboration, managing collaboration of 20 scientists in 7 countries using 5 telescopes to set first limits for Jupiter-like planets around common dwarf stars, determine limb-darkening of distant stars for the very first time, and detect first terrestrial-mass (5-Earth mass) exoplanet around a normal star
 - Determined 3-D distribution of dark matter around some galaxies
 - Quantified relationship between structure and dark matter in Milky Way
 - Determined deep cloud structure in atmosphere of Saturn
- 1991-1992 *As Program Director at U.S. National Science Foundation (NSF), USA*
- Managed program of small grants to fund high-risk science
 - Initiated first newsletter from NSF Astronomy division (AST) to national community
 - Managed all cross-division (AST + another NSF division) awards
 - Responsible for all AST projects related to education and diversity
 - Initiated study into factors correlated to proposal success and failure

Local, National & International Service

2015-present	Councillor and now Chair, Australian Capital Territory (ACT) Climate Change Council
2017-2020	Member, Business Advisory Board, ACT Renewable Energy Innovation Fund
2017-2019	Member, Scientific Advisory Board, Potsdam Institute for Climate Impact Research
2015	Chair, Memorandum Team, Nobel Laureate Symposium: <i>Climate Change, Changing Cities</i>
2013	Invited Speaker, 2013 Geological Society of America, Denver, CO, USA Contribution: <i>Elemental Cycles in the Anthropocene</i>
2011	Drafting Team, Nobel Laureate Stockholm Memorandum on Global Sustainability
2008-2011	As Chief Scientist for Australia, Member of: Prime Minister's Science, Engineering & Innovation Council, Executive Officer Prime Minister's Science Prize Selection Committee Educational Investment Fund Board Defence Science & Technology Organisation Advisory Board Rural Research & Development Council Higher Education Endowment Fund Assessment Panel Cooperative Research Centres Assessment Panel Climate Change Science Framework Implementation Group, Chair National Youth Science Forum, President Forum of Australian Chief Scientists, Founder and Chair
2005-2010	Board of Directors, Association of Universities for Research in Astronomy (AURA)
2006-2008	Board of Directors, Giant Magellan Telescope (GMT) Organisation
2002-2008	ANU Member Representative to AURA
2008	Australian GMT Advisory Committee to Australia Astronomy, Ltd
2003-2007	NCA Task Force on Extremely Large Telescopes (ELT)
2002-2007	National Committee for Astronomy (NCA), Australian Academy of Science
2002-2007	Australian Gemini Telescope Steering Committee
2002-2007	Board of Management for the Australian Astronomy MNRF Award
2004-2007	Chancellor's Award Committee, Australian National University (ANU)
2004-2006	Canberra Partnership Board, ACT, AU
2003-2005	University Science, Health & Engineering Research Committee, ANU
2000-2005	European OPTICON Extremely Large Telescope (ELT) Science Working Group
2004	International review team of the South African Astro-Geoscience Facilities for the NRF
2002-2003	Academic Board, Australian National University, Canberra, AU
1995-2002	Principal Investigator, International PLANET Collaboration
2001-2002	Science Advisory Committee for the Square Kilometer Array
2001-2002	Curriculum Advisory Committee for Astronomy, Kapteyn Astronomical Institute
2000-2002	European Southern Observatory (ESO) Programmes Committee, Member-at-Large
2000-2001	Chair, Stars and Planets Panel for OPTICON ELT Working Group
1996-1998	ESO Working Group on Exo-Solar Planets
1996-1998	Facilities Program Committee, Netherlands Organisation for Scientific Research

Scientific Organising and Steering Committees:

- 2013-2015 *Changing Climate, Changing Cities*
Nobel Laureates Symposium on Global Sustainability, Hong Kong 2015
also Chair, Symposium Memorandum Drafting Team
- 2008 *2008 Meeting of the Astronomical Society of Australia*
Perth, Australia
- 2006-2007 *IAU Symposium on Exoplanets: Physics, Dynamics and Evolution*
Suzhou, China
- 2006 *Transiting Extrasolar Planets*
25-28 September 2006, MPIA, Heidelberg, Germany
- 2003-2004 *Planetary Timescales: Stardust to Continents*
2003 White Conference, National Academy of Sciences, Canberra, AU
- 2002-2003 *Extrasolar Planets: Today and Tomorrow*
30 June - 4 July 2003, IAP, Paris, France
- 2001-2002 *Scientific Frontiers in Research on Extrasolar Planets*
11-14 June 2002, Washington, DC, USA
- 2001 *The SKA: Defining the Future*
9-12 July 2001, Berkeley, CA, USA
- 2000-2001 *Yale Cosmology Workshop: Shapes of Galaxies and Their Halos*
28-30 May 2001, New Haven, USA
- 1999-2000 *Planetary Systems in the Universe: Observation, Formation and Evolution*
7-11 August 2000, Manchester, England
- 1998-2000 *Microlensing 2000: A New Era for Microlensing Astrophysics*
21-25 February 2000, Capetown, South Africa
Chair, Scientific Organising Committee
- 1997-1999 *Impact of Large-Scale Photometry on the Research of Pulsating Stars*
IAU Conference, 9-13 August 1999, Budapest, Hungary
- 1997-1999 *VLT Opening Symposium: From Extrasolar Planets to Brown Dwarfs*
1-4 March 1999, Antofagasta, Chile
- 1997-1998 *4th International Workshop on Microlensing Surveys*
15-17 January 1998, Paris, France
- 1990 *Warped Disks and Inclined Rings around Galaxies*
Workshop 30 May - 1 June 1990, Pittsburgh PA
Scientific and Local Organising Committee

PUBLICATIONS

Over 140 publications, 65 in refereed journals, together garnering more than 4300 scientific citations and 1000 normalised citations
(*Sackett served as PhD or postdoctoral supervisor for authors in italics*)

Refereed Scientific Publications

Elemental cycles in the Anthropocene: mining aboveground

Penny D. Sackett

2016, in Geoscience for the Public Good and Global Development: Toward a Sustainable Future, eds. G.R. Wessel and J.K. Greenberg, J.K., Geological Society of America Special Papers 520, p. SPE520-11, doi:10.1130/2016.2520(11)

HATS-3b: An Inflated Hot Jupiter Transiting an F-type Star

Daniel D. R. Bayliss et al (29 authors, including Penny D. Sackett)

2013, AJ, 146, 113, arXiv:1306.0624

Endangered Elements: Conserving the Building Blocks of Life

(Invited Review) Penny Sackett

2012, Solutions, Volume 3, Issue 3

HATSouth: a global network of fully automated identical wide-field telescopes

G. Á. Bakos et al (24 authors, including *Daniel D. R. Bayliss* and Penny D. Sackett)

2013, PASP, 125, 154, arXiv:1206.1391

The Frequency of Hot Jupiters in the Galaxy: Results from the SuperLupus Survey

Daniel D. R. Bayliss and Penny D. Sackett

2011, ApJ, 743, 103, arXiv:1112.0359

Confirmation of a Retrograde Orbit for Exoplanet WASP-17b

Daniel D. R. Bayliss, Joshua N. Winn, Rosemary A. Mardling & Penny D. Sackett

2010, ApJ Letters, 722, L224-L227, arXiv:1009.5061

An *a priori* Investigation of Astrophysical False Positives in Ground-Based Transiting Planet Surveys

Tom M. Evans & Penny D. Sackett

2010, ApJ, 712, 38, arXiv:1002.0886

Microlensing exoplanets

Penny D. Sackett

2010, Scholarpedia, 5(1):3991

The Lupus Transit Survey for Hot Jupiters: Results and Lessons

Daniel D. R. Bayliss, *David T. F. Weldrake*, Penny D. Sackett, *Brandon W. Tingley* & *Karen M. Lewis*

2009, AJ, 137, 4368, astro-ph/0903.5121

Possibility of Detecting Pulsar Moons through Time-of-Arrival Analysis

Karen M. Lewis, Penny D. Sackett & Rosemary A. Mardling

2008, ApJL, 685, L153, astro-ph/0805.4263

Lupus-TR-3b: A Low-Mass Transiting Hot Jupiter in the Galactic Plane?

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The Frequency of Large Radius Hot and Very Hot Jupiters in ω Centauri

David T. F. Weldrake, Penny D. Sackett & Terry J. Bridges

2008, ApJ, 674, 1117, astro-ph/0710.3461

- A Deep Wide-Field Variable Star Catalog of ω Centauri
David T. F. Weldrake, Penny D. [Sackett](#) & Terry J. Bridges
 2007, AJ, 133, 1447, astro-ph/0610704
- Resolving Stellar Atmospheres I: The H α line and comparisons to microlensing observations
Christine Thurl, Penny D. [Sackett](#) & Peter H. Hauschildt
 2006, A & A, 455, 315, astro-ph/0604088
- MACHOs in M31? Absence of evidence but not evidence of absence
Jelte T.A. de Jong, Lawrence M. Widrow, Patrick Cseresnjes, Konrad Kuijken, Arlin P.S. Crotts, Alexander Bergier, Edward A. Baltz, Geza Gyuk, Penny D. [Sackett](#), Robert R. Uglesich & Will J. Sutherland
 2006, A & A, 446, 855, astro-ph/0507286
- Discovery of a cool planet of 5.5 Earth masses through gravitational microlensing
J.-P. Beaulieu, et al (PLANET, OGLE and MOA, 73 authors, includ. Penny D. [Sackett](#))
 2006, Nature, 439, 437, astro-ph/0601563
- The color signature of the transit of HD 209458 and discrepancies between stellar atmospheric models and observations
B. Tingley, *C. Thurl* & P. [Sackett](#)
 2006, A & A, 445, L27, astro-ph/0510633
- A Photometric Diagnostic to Aid in the Identification of Transiting Extra-solar Planets
Brandon Tingley & Penny D. [Sackett](#)
 2005, ApJ, 627, 1011, astro-ph/0503575
- An Absence of Hot Jupiter Planets in 47 Tucanae: Results of a Wide-Field Transit Search
David T.F. Weldrake, Penny D. [Sackett](#), Terry J. Bridges, & Kenneth C. Freeman
 2005, ApJ, 620, 1043, astro-ph/0411233
- A Method for the Detection of Planetary Transits in Large Time-Series Datasets
David T.F. Weldrake & Penny D. [Sackett](#)
 2005, ApJ, 620, 1033, astro-ph/0411234
- Phase light curves for extrasolar Jupiters and Saturns
Ulyana A. Dyudina, Penny D. [Sackett](#), *Daniel D.R. Bayliss*, Sara Seager, Carolyn C. Porco, Henry B. Throop & Luke Dones
 2005, ApJ, 618, 973-986, astro-ph/0406390
- A Comprehensive Catalogue of Variable Stars in the field of 47 Tucanae
David T.F. Weldrake, Penny D. [Sackett](#), Terry J. Bridges, & Kenneth C. Freeman
 2004, AJ, 128, 736, astro-ph/0405133
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- PLANET II: A Microlensing and Transit Search for Extrasolar Planets
 Penny D. [Sackett](#), M.D. Albrow, *J.-P. Beaulieu*, J.A.R. Caldwell, C. Coutures, *M. Dominik*, J. Greenhill, K. Hill, K. Horne, U.-G. Jorgensen, S. Kane, D. Kubas, R. Martin, J. Menzies, K.R. Pollard, K.C. Sahu, J. Wambsganss, R. Watson, A. Williams (PLANET),
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 2004, IAU Symposium 213 (San Francisco: ASP), 35, astro-ph/0211098

- High-Precision Limb-Darkening Measurement of a K3 Giant Using Microlensing
D.L. Fields, M.D. Albrow, J.H. An, *J.-P. Beaulieu*, J.A.R. Caldwell, D.L. DePoy, *M. Dominik*, *B.S. Gaudi*, A. Gould, J. Greenhill, K. Hill, S. Kane, R. Martin, J. Menzies, R.W. Pogge, K.R. Pollard, P.D. Sackett, K.C. Sahu, P. Vermaak, R. Watson & A. Williams (PLANET), and J.-F. Glicenstein & P.H. Hauschildt
2003, ApJ, 596, 1305, astro-ph/0303638
- A Short, Non-Planetary Microlensing Anomaly: Observations and Lightcurve Analysis of MACHO 99-BLG-47
M.D. Albrow, J. An, *J.-P. Beaulieu*, J.A.R. Caldwell, D.L. DePoy, *M. Dominik*, *B.S. Gaudi*, A. Gould, J. Greenhill, K. Hill, S. Kane, R. Martin, J. Menzies, R.W. Pogge, K.R. Pollard, P.D. Sackett, K.C. Sahu, P. Vermaak, R. Watson, A. Williams (PLANET)
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- First microlens mass measurement: PLANET photometry of EROS BLG-2000-5
J. An, M.D. Albrow, *J.-P. Beaulieu*, J.A.R. Caldwell, D.L. DePoy, *M. Dominik*, *B.S. Gaudi*, A. Gould, J. Greenhill, K. Hill, S. Kane, R. Martin, J. Menzies, R.W. Pogge, K.R. Pollard, P.D. Sackett, K.C. Sahu, P. Vermaak, R. Watson, A. Williams (PLANET)
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- Detection of a Thick Disk in the Edge-on Low Surface Brightness Galaxy ESO 342-G017
Mark J. Neeser, Penny D. Sackett, Guido De Marchi, & Francesco Paresce
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- Interpreting Debris from Satellite Disruption in External Galaxies
Kathryn V. Johnston, Penny D. Sackett and James S. Bullock
2001, ApJ, 557, 137, astro-ph/0101543
- H α Equivalent Width Variations across the Face of Microlensed K Giant in the Galactic Bulge
M.D. Albrow, J. An, *J.-P. Beaulieu*, J.A.R. Caldwell, *M. Dominik*, J. Greenhill, K. Hill, S. Kane, R. Martin, J. Menzies, K.R. Pollard, P.D. Sackett, K.C. Sahu, P. Vermaak, R. Watson, A. Williams (PLANET), and P. Hauschildt
2001, ApJL, 550, L173, astro-ph/0011380
- Limits on the Abundance of Galactic Planets from Five Years of PLANET Observations
M.D. Albrow, J. An, *J.-P. Beaulieu*, J.A.R. Caldwell, D.L. DePoy, *M. Dominik*, *B.S. Gaudi*, A. Gould, J. Greenhill, K. Hill, S. Kane, R. Martin, J. Menzies, *R.M. Naber*, J.-W. Pel, R.W. Pogge, K.R. Pollard, P.D. Sackett, K.C. Sahu, P. Vermaak, *P.M. Vreeswijk*, R. Watson, A. Williams (PLANET)
2001, ApJL, 556, L113, astro-ph/0008078

- PLANET observations of microlensing event OGLE-1999-BUL-23: Limb-darkening measurement of the source star
M.D. Albrow, J. An, *J.-P. Beaulieu*, J.A.R. Caldwell, D.L. DePoy, M. Dominik, *B.S. Gaudi*, A. Gould, J. Greenhill, K. Hill, S. Kane, R. Martin, J. Menzies, R.W. Pogge, K.R. Pollard, P.D. Sackett, K.C. Sahu, P. Vermaak, R. Watson, A. Williams (PLANET Collaboration)
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- Discovery of the optical counterpart and early optical observations of GRB990712
K.C. Sahu et al. (49 authors, including P. D. Sackett and the PLANET collaboration)
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- Limits on Stellar and Planetary Companions in Microlensing Event OGLE-1998-BUL-14
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- Detection of Rotation in a Binary Microlens: PLANET Photometry of MACHO 97-BLG-41
M.D. Albrow, *J.-P. Beaulieu*, J.A.R. Caldwell, *M. Dominik*, *B.S. Gaudi*, A. Gould, J. Greenhill, K. Hill, S. Kane, R. Martin, J. Menzies, *R.M. Naber*, K.R. Pollard, P.D. Sackett, K.C. Sahu, P. Vermaak, R. Watson, A. Williams (PLANET), H.E. Bond, I.M. van Bemmelen
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- The Stellar Content of the Halo of NGC 5907 from Deep HST NICMOS Imaging
S.E. Zepf, M.C. Liu, F.R. Marleau, P.D. Sackett, & J.R. Graham
2000, AJ, 119, 1701, astro-ph/0001154
- Combined Analysis of the Binary-Lens Caustic-Crossing Event MACHO 98-SMC-1
C. Afonso et al., C. Alcock et al., S.H. Rhie et al., A. Udalski et al., M.D. Albrow et al. (94 authors in total, including P.D. Sackett: EROS, MACHO/GMAN, MPS, OGLE and PLANET Collaborations)
2000, ApJ, 532, 340, astro-ph/9907247
- Detection Efficiencies of Microlensing Datasets to Stellar and Planetary Companions
B.S. Gaudi and P.D. Sackett
2000, ApJ, 528, 56, astro-ph/9904339
- A Complete Set of Solutions For Caustic-Crossing Binary Microlensing Events
M.D. Albrow, *J.-P. Beaulieu*, J.A.R. Caldwell, D.L. DePoy, *M. Dominik*, *B.S. Gaudi*, A. Gould, J. Greenhill, K. Hill, S. Kane, R. Martin, J. Menzies, *R.M. Naber*, R.W. Pogge, K.R. Pollard, P.D. Sackett, K.C. Sahu, P. Vermaak, R. Watson, A. Williams (PLANET Collaboration)
1999, ApJ, 522, 1022, astro-ph/9903008
- Limb-Darkening of a K Giant in the Galactic Bulge: PLANET Photometry of MACHO 97-BLG-28
M.D. Albrow, *J.-P. Beaulieu*, J.A.R. Caldwell, *M. Dominik*, J. Greenhill, K. Hill, S. Kane, R. Martin, J. Menzies, *R.M. Naber*, J.-W. Pel, K.R. Pollard, P.D. Sackett, K.C. Sahu, P. Vermaak, R. Watson, A. Williams (PLANET Collaboration) and M.S. Sahu
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- The Relative Lens-Source Proper Motion in MACHO 98-SMC-1
M.D. Albrow, *J.-P. Beaulieu*, J.A.R. Caldwell, D.L. DePoy, *M. Dominik*, *B.S. Gaudi*, A. Gould, J. Greenhill, K. Hill, S. Kane, R. Martin, J. Menzies, *R.M. Naber*, J.-W. Pel, K.R. Pollard, P.D. Sackett, K.C. Sahu, P. Vermaak, R. Watson, A. Williams (PLANET Collaboration), and R. W. Pogge
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 Source of Microlensing Toward the LMC
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- Does the Milky Way have a Maximal Disk?
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- Dust and Infrared Imaging of Polar Ring Galaxies
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- MACHOs in a Flattened Halo
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- New Observations and a Photographic Atlas of Polar-Ring Galaxies
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- Radio Observations of Saturn as a Probe of Its Atmosphere and Cloud Structure
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Ralph Z. Roskies and P. D. Sackett

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Λ -Parameters for Asymmetric Lattice Gauge Theories with Fermions

P. D. Sackett

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Lecture Series

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Penny D. Sackett

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Technical Reports and Communications

Learning from Canberra's Climate-Fuelled Summer of Crisis

Paul Bannister, Cristopher Brack, Mark Howden, Karen Jesson, Ben Ponton, Penny D Sackett (Chair), Sophia Hamblin Wang

2020, ACT Climate Change Council, Canberra

Community Listening Report on Adaptation to Climate Crises: The Extreme Summer of 2019/20

Penny Sackett, Will Steffen and Karen Jessen

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What is a Carbon Budget?

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Sub-National Climate Policies: How does the ACT compare? Part I: Report

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Back home on Stromlo!

P.D. Sackett

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P. D. Sackett, M. Gillon, *D. D. R. Bayliss*, *D. T. F. Weldrake*, & *B. Tingley*

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D. D. R. Bayliss, P. D. Sackett, & *D. T. F. Weldrake*

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