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Biography

Sandy is Professor of Tectonics and Geodynamics in the School of Earth, Atmosphere and Environment, Faculty of Science. Before moving to Monash University he was Professor and Chair, Department of Earth Sciences, University of Toronto. Sandy was educated in Scotland (BSc Hons, University of Dundee) and Sweden (PhD, Uppsala University).

Qualifications

Employment

Professor

School of Earth Atmosphere and Environment
MONASH UNIVERSITY
26 Jul 2010 → present

Professor

University of Toronto
Toronto, Canada
1 Jul 1989 → 1 Jul 2010

Research output

Zircon U-Pb-Hf isotope evidence for juvenile Penokean sources (ca. 1.9 Ga) in the SW Grenville Province

Strong, J. W. D., Cruden, A. R., Cawood, P. A. & Dickin, A. P., 15 Dec 2023, In: Lithos. 462-463, 14 p., 107420.

Failure of load-bearing dyke networks as a trigger for volcanic edifice collapse

Thiele, S. T., Cruden, A. R. & Micklethwaite, S., Dec 2023, In: Communications Earth and Environment. 4, 1, 8 p., 382.

Structural inheritance in amagmatic rift basins: Manifestations and mechanisms for how pre-existing structures influence rift-related faults

Samsu, A., Micklethwaite, S., Williams, J. N., Fagereng, Å. & Cruden, A. R., Nov 2023, In: Earth-Science Reviews. 246, 31 p., 104568.

The Development of Fault Networks at the Termination of Continental Transform Faults When Their Connecting Plate Boundary Is "Misaligned"

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Selective inversion of rift basins in lithospheric-scale analogue experiments

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Strong, J. W. D., Mulder, J. A., Cawood, P. A., Cruden, A. R. & Nebel, O., 1 Aug 2023, In: Precambrian Research. 393, 12 p., 107096.

The effects of inward and outward dipping craton margin geometry on upper crustal deformation: Insights from analogue modelling: Craton margin geometries

Amirpoorsaeed, F., Samsu, A., Betts, P. G., Cruden, S. & Armit, R., 23 Apr 2023. 1 p.

Magnetic fabrics reveal three-dimensional flow processes within elongate magma fingers at the margin of the Shonkin Sag laccolith (MT, USA)

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Hydraulic Fracturing Mechanisms Leading to Self-Organization Within Dyke Swarms

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Role of volatiles in intrusion emplacement and sulfide deposition in the supergiant Norilsk-Talnakh Ni-Cu-PGE ore deposits

Barnes, S. J., Yudovskaya, M. A., Iacono-Marziano, G., Le Vaillant, M., Schoneveld, L. E. & Cruden, A. R., 2023, In: *Geology*. 51, 11, p. 1027-1032 6 p.

Saucers, Fingers, and Lobes: New Insights on Sill Emplacement From Scaled Laboratory Experiments

Arachchige, U. N., Cruden, A. R., Weinberg, R., Slim, A. & Köpping, J., Nov 2022, In: *Journal of Geophysical Research: Solid Earth*. 127, 11, 30 p., e2022JB024421.

Catastrophic growth of totally molten magma chambers in months to years

Annen, C., Latypov, R., Chistyakova, S., Cruden, A. R. & Nielsen, T. F. D., 23 Sept 2022, In: *Science Advances*. 8, 38, 9 p., eabq0394.

Eo-Paleoarchean detrital zircon in the Winnipeg River terrane, Western Superior Province: Provenance and implications

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Papeschi, S., Mazzarini, F., Musumeci, G. & Cruden, A. R., Jun 2022, In: *Journal of Structural Geology*. 159, 16 p., 104600.

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Reactivation of Magma Pathways: Insights From Field Observations, Geochronology, Geomechanical Tests, and Numerical Models

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Hydrochronology of a proposed deep geological repository for low-and intermediate-level nuclear waste in southern Ontario from U–Pb dating of secondary minerals: Response to silurian and cretaceous events

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Ore shoots in folded and fractured rocks – Insights from 3D modelling of the Fosterville gold deposit (Victoria, Australia)

Vollgger, S. A., Wilson, C. J. L., Micklethwaite, S., Tomkins, A. G. & Cruden, A. R., Mar 2020, In: Ore Geology Reviews. 118, 14 p., 103272.

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Review of drones, photogrammetry and emerging sensor technology for the study of dykes: best practises and future potential

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Tiny particles building huge ore deposits – Particle-based crystallisation in banded iron formation-hosted iron ore deposits (Hamersley Province, Australia)

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Unzipping continents and the birth of microcontinents

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Colloidal origin of microbands in banded iron formations

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Unique occurrence of a folded in-vent dike: New insights on magma-water mixing

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Rapid, semi-automatic fracture and contact mapping for point clouds, images and geophysical data

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Ingress of magmatic Ni-Cu sulphide liquid into surrounding brittle rocks: physical & structural controls

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The role of deformation in the formation of banded iron formation-hosted high-grade iron ore deposits, Hamersley Province (Australia)

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Ore shoot formation in an orogenic gold deposit

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Awards

Three-dimensional Bayesian Modelling of Geological and Geophysical data

Ailleres, L. (Primary Chief Investigator (PCI)), Jessell, M. (Chief Investigator (CI)), Grose, L. (Chief Investigator (CI)), Tanaka, E. (Chief Investigator (CI)), Droniou, J. (Chief Investigator (CI)), Armit, R. (Chief Investigator (CI)), Kemp, C. (Partner Investigator (PI)), Cruden, S. (Chief Investigator (CI)), Lindsay, M. (Partner Investigator (PI)), Giraud, J. (Partner Investigator (PI)), Kelka, U. (Partner Investigator (PI)), Laurent, G. (Partner Investigator (PI)), Caumon, G. (Partner Investigator (PI)), Ogarko, V. (Chief Investigator (CI)), Betts, P. (Chief Investigator (CI)), Pirot, G. (Partner Investigator (PI)), Rawling, T. J. (Partner Investigator (PI)), Bonnardot, M.-A. (Partner Investigator (PI)), Murdie, R. E. (Partner Investigator (PI)), Gessner, K. (Partner Investigator (PI)), Wise, T. (Chief Investigator (CI)), Jackson, D. (Partner Investigator (PI)), Spampinato, G. (Partner Investigator (PI)), Bombardieri, D. (Partner Investigator (PI)), Brown, D. (Partner Investigator (PI)), Heaven, R. (Partner Investigator (PI)) & Mahoney, L. (Chief Investigator (CI))
Australian Research Council (ARC): A\$537,675.00
20/04/23 → 19/04/26

Projects

Add mountains and shake: plate boundary fault and earthquake patterns

Cruden, S. (Primary Chief Investigator (PCI)), Finch, M. (Chief Investigator (CI)), Quigley, M. C. (Chief Investigator (CI)) & Riller, U. (Partner Investigator (PI))
1/09/22 → 31/08/25

Advancing Mineral Exploration Models for Orogenic Gold Deposits

Tomkins, A. (Primary Chief Investigator (PCI)), Cruden, S. (Chief Investigator (CI)), Maas, R. (Chief Investigator (CI)), Micklethwaite, S. (Chief Investigator (CI)), Wilson, C. (Chief Investigator (CI)), Cayley, R. (Partner Investigator (PI)), Gibson, H. (Partner Investigator (PI)) & Hitchman, S. (Partner Investigator (PI))
Australian Research Council (ARC), Monash University, University of Melbourne, University of Western Australia, Crocodile Gold Corporation, Geological Survey of Victoria, Intrepid Geophysics, Newmarket Gold Victorian Holdings Pty Ltd
17/03/16 → 31/12/19

Australian Virtual Experimental Laboratory: a multimode geoscience facility

Foley, S. F. (Primary Chief Investigator (PCI)), Mavrogenes, J. A. (Chief Investigator (CI)), Putnis, A. (Chief Investigator (CI)), Brugger, J. (Chief Investigator (CI)), Clark, S. M. (Chief Investigator (CI)), O'Neill, S. (Chief Investigator (CI)), Cruden, S. (Chief Investigator (CI)) & Evans, K. A. (Chief Investigator (CI))

Macquarie University, Australian National University (ANU), Curtin University, Monash University
1/01/16 → 31/12/16

Enabling 3D stochastic geological modelling

Ailleres, L. (Primary Chief Investigator (PCI)), Jessell, M. (Chief Investigator (CI)), de Kemp, E. A. (Partner Investigator (PI)), Caumon, G. (Partner Investigator (PI)), Wellmann, J. F. (Partner Investigator (PI)), Armit, R. (Chief Investigator (CI)), Droniou, J. (Chief Investigator (CI)), Lindsay, M. D. (Chief Investigator (CI)), Cui, T. (Chief Investigator (CI)), Betts, P. (Chief Investigator (CI)), Cruden, S. (Chief Investigator (CI)), Kemp, C. (Partner Investigator (PI)), Gessner, K. (Partner Investigator (PI)), Spampinato, G. P. T. (Partner Investigator (PI)), Harrison, M. (Partner Investigator (PI)) & Kessler, H. (Partner Investigator (PI))
12/11/18 → 30/06/24

Evolution of Proterozoic multistage rift basins – key to mineral systems

Jessell, M. (Primary Chief Investigator (PCI)), Gorczyk, W. (Chief Investigator (CI)), Cruden, S. (Chief Investigator (CI)), Rey, P. F. (Chief Investigator (CI)), Lindsay, M. (Chief Investigator (CI)), Betts, P. (Chief Investigator (CI)), Salles, T. (Chief Investigator (CI)), Aitken, A. R. A. (Chief Investigator (CI)), Keep, M. (Chief Investigator (CI)), Lang, S. (Chief Investigator (CI)), Denyszyn, S. (Chief Investigator (CI)), Gessner, K. (Partner Investigator (PI)), Schmid, S. (Partner Investigator (PI)), Occhipinti, S. (Partner Investigator (PI)), Cameron, G. (Partner Investigator (PI)), McCuaig, T. (Partner Investigator (PI)), McCracken, S. (Primary Chief Investigator (PCI)) & Subramanya, A. (Partner Investigator (PI))
22/07/20 → 21/07/24

Laboratory modelling of plate boundary transpression zones: Implications for fluid migration and earthquake hazards in continental crust

Cruden, S. (Primary Chief Investigator (PCI)), Withers, M. (Chief Investigator (CI)) & Riller, U. (Chief Investigator (CI))
1/03/20 → 28/02/21

Magma transport dynamics and ore deposits

Cruden, S. (Primary Chief Investigator (PCI)), Fiorentini, M. (Chief Investigator (CI)), Barnes, S. (Partner Investigator (PI)), Bungler, A. (Partner Investigator (PI)) & Jackson, C. A. L. (Partner Investigator (PI))
Australian Research Council (ARC)
1/07/19 → 17/07/23

The First Australian High Pressure Synchrotron Facility for Geoscience Research

Cruden, S. (Primary Chief Investigator (PCI)), O'Neill, H. (Chief Investigator (CI)), Rushmer, T. (Chief Investigator (CI)) & Turner, S. P. (Chief Investigator (CI))
Australian Research Council (ARC)
1/01/12 → 31/12/12

Three-dimensional Bayesian Modelling of Geological and Geophysical data

Ailleres, L. (Primary Chief Investigator (PCI)), Jessell, M. (Chief Investigator (CI)), Grose, L. (Chief Investigator (CI)), Tanaka, E. (Chief Investigator (CI)), Droniou, J. (Chief Investigator (CI)), Armit, R. (Chief Investigator (CI)), Kemp, C. (Partner Investigator (PI)), Cruden, S. (Chief Investigator (CI)), Lindsay, M. (Partner Investigator (PI)), Giraud, J. (Partner Investigator (PI)), Kelka, U. (Partner Investigator (PI)), Laurent, G. (Partner Investigator (PI)), Caumon, G. (Partner Investigator (PI)), Ogarko, V. (Chief Investigator (CI)), Betts, P. (Chief Investigator (CI)), Pirot, G. (Partner Investigator (PI)), Rawling, T. J. (Partner Investigator (PI)), Bonnardot, M.-A. (Partner Investigator (PI)), Murdie, R. E. (Partner Investigator (PI)), Gessner, K. (Partner Investigator (PI)), Dutch, R. A. (Partner Investigator (PI)), Wise, T. (Chief Investigator (CI)), Jackson, D. (Partner Investigator (PI)), Spampinato, G. (Partner Investigator (PI)), Bombardieri, D. (Partner Investigator (PI)), Brown, D. (Partner Investigator (PI)), Heaven, R. (Partner Investigator (PI)) & Mahoney, L. (Chief Investigator (CI))
Australian Research Council (ARC)
20/04/23 → 19/04/26

Three-dimensional subduction models of overriding plate deformation and mantle flow using laboratory and numerical methods

Schellart, W. (Primary Chief Investigator (PCI)), Cruden, S. (Chief Investigator (CI)) & Stegman, D. (Partner Investigator (PI))
Australian Research Council (ARC), Monash University
4/01/11 → 1/10/14