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| Alison Lewis |
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I am a Chemical Engineer, currently the Dean of the Faculty of Engineering and the Built Environment at the University of Cape Town, and a member of the Senior Leadership Team at the University of Cape Town.

**Links**

* Faculty of Engineering & the Built Environment (EBE) <https://ebe.uct.ac.za/>
* LinkedIn https://www.linkedin.com/in/alison-lewis-4405a386/?originalSubdomain=za
* Google Scholar https://scholar.google.co.za/citations?user=yaaQvscAAAAJ&hl=en
* ResearchGate https://www.researchgate.net/profile/Alison-Lewis-2
* ORCID https://orcid.org/0000-0001-6544-1227

**Skills and Experience**

## June 2015 – present: Dean, Faculty of Engineering and the Built Environment, University of Cape Town

* Contributing to strategic leadership in a complex and challenging environment
* Developing and implementing the strategic vision for the faculty
* Leading and developing the faculty of 4500 students and 450 staff in line with an innovative, progressive and strategic vision
* Assuring the continuing provision of high-quality education at both undergraduate and postgraduate levels,
* Developing the faculty research profile
* Ensuring sound financial management, including planning and budgeting for the faculty
* Leading transformation in the faculty, and in the University generally, by implementing measures to enhance diversity in the institutional culture, including the race and gender representation of students and staff in the faculty
* Forging and sustaining constructive links with the professions represented in the faculty.

## ****Jan 2013 – May 2015: Head of Department, Chemical Engineering, University of Cape Town****

Strategic planning, vision development and co-ordination; budgeting and financial planning; line management, performance review, staff development and coaching for academic, technical and administrative staff; implementation of transformation initiatives such as the creation of new departmental posts; facilitating projects such as the new curriculum project, the laptop project and Assistant Lecturer development programme;

## ****Jan 1999 – present: Director, Crystallisation and Precipitation Research Unit, UCT http://www.crystal.uct.ac.za/****

 Founded and developed the Crystallisation and Precipitation Research Unit; raised/co-raised R72m in funding since 2001, supervised/co-supervised 51 MSc and PhD students; created 4 academic, administrative and technical posts; published 79 journal papers, 76 international conference presentations, 1 patent, 10 books/book chapters and 1 textbook: “Industrial Crystallization: Fundamentals and Applications” (Cambridge University Press, August 2015)

## ****Jan 1988 – Dec 1989: Process Engineer, South African Nylon Spinners****

Design and commissioning

## ****1981 –1987 & 1990-1993: BSc (ChemEng), MSc (Eng) and PhD Student, UCT****

Upfront Editor, Cape Democrats, United Democratic Front, 1988 -1990; Education Officer, UCT Students Representative Council, 1984/85; Flashover Editor, Engineering Students Council, 1983/84

**Qualifications and Employment Record**

**June 2015 – present:** Dean, Faculty of Engineering and the Built Environment, University of Cape Town

**Jan 2013 – May 2015:** Head of Department, Chemical Engineering Department, UCT

**2010 – present:** University Orator, “to prepare and deliver citations for the conferment of honorary degrees or any citations at the invitation of the Vice-Chancellor”, UCT

**Jan 2007 – present:** Professor, Chemical Engineering Department, UCT

**Jan 2002 – Dec 2006:** Associate Professor, Chemical Engineering Department, UCT

**Jul 1995 – Dec 2001:** Senior Lecturer, Chemical Engineering Department, UCT

**Jan 1994 - Jul 1995:** Post-Doc Fellow, Water Research Group, Civil Engineering Department (UCT)

**1990-1993:** PhD Civil Engineering (UCT)

**1988-1989:** Process Engineer, South African Nylon Spinners

**1986-1987:** MSc Chemical Engineering (UCT)

**1981-1985:** BSc Chemical Engineering (UCT)

# Study and Research Appointments

## ****1-31 Dec 2016:** Visiting Professor, Group for Molecular Engineering of Functional Materials (GMF), Institute of Chemical Science and Engineering, Swiss Federal Institute of Technology (EPFL), Sion, Valais, Switzerland**

## ****Jan – May 2009:** Visiting Professor, University of Mauritius**

## ****Jan – Dec 2003:** Visiting Research Associate, Department of Chemical and Process Engineering, Sheffield University, United Kingdom**

# Professional/Academic

**2025: Member of TWAS Membership Advisory Committee (MAC), 2025-2026**

**2025: Steering Committee Member for Top 10 Emerging Technologies 2025 for the World Economic Forum**

**2024: University of Stanford’s List of Top 2% Scientists, Rank in field 793; 20**

**2020-2024: Member of the Executive Committee of the South African Academy of Engineering (SAAE)**

**2014: Fellow of the Institute of Chemical Engineers (FIChemE)**

**2013: Fellow of the South African Institute of Mining and Metallurgy (FSAIMM)**

**2012: Fellow of the South African Institute of Chemical Engineers (FSAIChE)**

**Fellow of the University of Cape Town College of Fellows**

**2011: Fellow of the South African Academy of Engineering (FSAAE)**

**2010: Member of the Academy of Science of South Africa (ASSAF)**

**1990: Registered Professional Engineer, Engineering Council of South Africa (PrEng)**

# Honours and Awards

## 2025: **Fellow of the World Academy of Science (TWAS), 2025**

## 2024: International Member of the National Academy of Engineering, USA

## 2022: B2 Rating, National Research Foundation, “Researchers who enjoy considerable international recognition by their peers for the high quality and impact of their recent research outputs”

## 2021: Water Research Commission Legends Award, in recognition of “contribution as a WRC partner, researcher and leader that brought national and global recognition for the South African and global water sector”.

National Science and Technology Forum (NSTF) Engineering Research Capacity Development Award <http://www.nstf.org.za/wp-content/uploads/2019/07/2019-06-28-NSTF-South32-Awards.pdf>

'For training, nurturing and mentoring students in the Crystallization and Precipitation Research Unit at UCT through new research into the recovery of valuable metals, water and minerals through innovative methods'

## 2018: Rockefeller Fellowship Award for a Bellagio residency during the thematic month on Science for Development at the Bellagio Centre, November 2018.

## 2016: Africa Water Leadership Award: conferred on "outstanding professionals who have the vision, flair, acumen and professionalism to demonstrate excellent Leadership and Management skills in an organisation, making changes and achieving results”.

## 2015: Distinguished Woman Scientist Award, Department of Science and Technology, South African Women in Science Awards for Research and Innovation; <https://www.youtube.com/watch?v=2lMJc64x97s>

## Renewal of B2 Rating, National Research Foundation (B2 = Researchers who enjoy considerable international recognition by their peers for the high quality and impact of their recent research outputs)

##  WRC Knowledge Tree Award for research excellence in the category of New Products and Services for Economic Development.

## Second most cited article in Hydrometallurgy: Lewis, A.E. 2010. A review of metal sulphide precipitation, Hydrometallurgy, 104 (2) 222-234

## 2014: University Orator appointment extended for a second five-year term

## 2012: Distinguished Woman in Physical and Engineering Science award, Department of Science and Technology, South African Women in Science Awards “for an outstanding contribution to building South Africa’s scientific and research knowledge base”

## 2010: NRF President’s “Champion of Research Capacity Development at South African Higher Education Institutions” Award, <https://mg.co.za/article/2016-08-15-00-professor-alison-emslie-lewis-a-novel-technology-for-mine-water-and-brine-treatment>

## 2009: B2 Rating, National Research Foundation, “Researchers who enjoy considerable international recognition by their peers for the high quality and impact of their recent research outputs”

## Best paper award, Australasian Institute of Mining and Metallurgy’s Water in Mining Conference, Perth, “Worth its salt – how Eutectic Freeze Crystallization can be used to recover water and salt from hypersaline mine waters”

## 2004, 2005 and 2006: Finalist for Research Capacity Development, NSTF Awards

## 2003: OLI Systems Ltd, recipient of the crystallisation research grant for United States Department of Energy (DOE) crystallisation project, Rated as “Internationally leading” in research quality, research planning and practice, potential scientific impact and

## “Outstanding” for output of research staff, communication of research outputs, potential benefits to society and cost-effectiveness by external reviewers for the personal contribution to the US DOE project on crystallisation

## Research Fellowship, United Kingdom Engineering and Physical Sciences Research Council (EPSRC)

## 1999, 2000 and 2001: UCT’s Distinguished Teacher’s Award, shortlisted

## 1998, 1999 and 2000: UCT Merit Award

# External Deanship Presentations

1. Lewis, A.E., 2022. **The Future Fit Dean**, Invited presentation to Deans’ Retreat, University of Pretoria, 30 November 2022
2. Lewis, A.E., 2020. **Reimagining Learning for Higher Education**, World Economic Forum Interaction Lab no. 1, Thursday, 16 July 2020, <https://toplink.weforum.org/communities/a0e0X00000nPWzaQAG/chief-higher-education-learning-officers-community/library#preview=16469>
3. Lewis, A.E., 2020. **Leaders, Followers or Spectators: African Research Universities and the Future**, Africa Oxford Initiative (AfOx Insaka), online 2 July 2020, <https://www.youtube.com/watch?v=ekqHNVAGCaM>
4. Lewis, A.E., 2019. **Leaders, Followers or Spectators: African Research Universities and 4IR**, Africa Research Universities Alliance (ARUA) Second Biennial Conference. Africa and the Fourth Industrial Revolution: Defining a Role for Research Universities. University of Nairobi: 18-20 November
5. Lewis, A.E., 2019. **Panel 1: The Future of Work**. 10th international Reinventing Higher Education workingconference**,** Brown University, Providence, Rhode Island. 4-5 April
6. Lewis, A.E., 2018. **Bridging the gap between Academia, Industry, and Government.** Keynote talk. CESA Infrastructure Indaba 2018: Engineering the Future Now! Southern Sun, OR Tambo. 6 March. <http://cesa.co.za/indaba/speakers.php>
7. Lewis, A.E., 2018. **From Crisis to Leader,** Panellist at the #Co-Create Design Festival Conference, #BeyondTheCrisis, East City, Cape Town. 22-24 February 2018, <http://cocreatesa.nl/cocreatedesign-festival-speakers/>
8. Andrews, P. and Lewis, A.E., 2017. Transformation and Decolonisation at the University of Cape Town and Why its Urgency? Perspectives from the EBE and Law Faculties. Alumni presentation: New York City, 13 April
9. Andrews, P. and Lewis, A.E., 2016. Institutional Panel: **Key Challenges and opportunities at UCT in the context of higher education change**. New Academic Practitioners Programme, Residential workshop: Mont Fleur Conference Centre, 8-10 June
10. Lewis, A.E., 2015. “Curriculum development and design for student success and transformation in the Faculty of Engineering and the Built Environment at the University of Cape Town” GEDC/AEDC SUMMIT on Education, Addis Ababa, Ethiopia, September 17 – 18
11. Lewis,A.E, Pinkston, T (University of Southern California, Los Angeles); Xu, Z ( SUSTech, Shenzhen, Diaz, P (University Carlos III, Madrid); Srolovitz, D (University of Hong Kong): **Deans Dialogue: East meets West and the Global South**; Global Engineering Deans Council Industry Forum, SUSTech University, Shenzhen, China; 14-17 January 2014.

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# Selected Keynote Addresses/Plenary Lectures/ Invited Contributions

1. Lewis, A.E., 2023, **Development of Crystallization Processes for Production of Critical Metals,** 6th Asian Crystallization Technology Symposium (ACTS), 25-26 September 2023 • Taipei, Taiwan
2. Lewis, A.E., 2021, **New Thinking for Crystallization and Precipitation in Extractive Metallurgy,** TMS (The Minerals, Metals & Materials Society), Extraction and Processing Division, Symposium on Rare Metal Extraction and Processing, 150th TMS annual meeting, Orlando, March 14-18, 2021
3. Lewis, A.E., 2019**. South African Brines: Characterisation and Treatment**, presentation as the official South African Representative, Workshop on Salts and Chemicals Extraction from Saline Waters For Indian Ocean Rim (IORA) Countries, October 15-17, 2019, Tehran, Islamic Republic of Iran
4. Lewis, A.E., 2017. **Crystallization and precipitation in extractive metallurgy.** COM 2017: Conference of Metallurgists, 27 – 30 August 2017, Hyatt Regency Vancouver, Vancouver, BC, Canada
5. Lewis, A.E., 2015. **"Rethinking Precipitation Processes: The Art of the State,** "Distinguished Lecturer Series: Lectures at the Leading Edge, University of Toronto, February 2015. <http://www.chem-eng.utoronto.ca/news/Lectures_at_the_Leading_Edge___Emerging_Leaders_Lecture_Series.htm>
6. Lewis, A.E., 2014. **Turning toxins into treasure, recovery of metals from wastewater using crystallization,** IMETE – International Master of Science in Environmental Technology and Engineering,Ghent University, Belgium, 8-12 September 2014, <http://www.imetesummer.ugent.be/programme.htm>
7. Lewis, A.E., 2014. **Is it art? Or is it science? From Alchemy to Hydrometallurgy: Industrial Crystallization Research at the University of Cape Town**, Max Planck Institute of Complex Technical Systems, Magdeburg, Germany, 21-23 May 2014, <http://www.mpi-magdeburg.mpg.de/2337249/past_colloquia>
8. Lewis, A.E., 2014. **Making value out of waste: why Eutectic Freeze Crystallization is a hot topic right now**, ACQUEAU – Water Beyond; Europe Workshop, Brussels, Belgium, 20-21 February, 2014, <http://www.eurekanetwork.org/showevent?p_r_p_564233524_articleId=3559136&p_r_p_564233524_groupId=10137>
9. Lewis, A.E., 2014**. Rethinking water and waste - The State of the Art of Eutectic Freeze Crystallisation**. 11th International Water Association (IWA) Leading-Edge Technology conference, Abu Dhabi, United Arab Emirates, 26-30 May 2014, **Keynote address**
10. Lewis, A.E., Randall, D.G., Reddy, S.T., Jivanji, R. and Nathoo, J., 2009. **Worth its salt – how Eutectic Freeze Crystallization can be used to recover salt from hypersaline mine waters**, Water in Mining, AusIMM, Perth Australia, September, 2009, Keynote address, <https://www.ausimm.com.au/publications/publication.aspx?ID=5387>

# Publications

## ****Articles in international, accredited, peer -reviewed journals****

1. Sibanda, T., Mgabhi, S., Chivavava, J. and Lewis, A. E., **Using simulation and lab validation to develop a MnCO­­3 recovery process using MnSO4 and CO2**, Hydrometallurgy, (Impact factor 4.8), (submitted)
2. Matau, M., Mgabhi, S. Motsepe, L.A., Chivavava, J. and Lewis, A. E. **Using a novel material to reduce ice scaling in Freeze Separation**, Separation and Purification Technology (Impact factor 8.1) (submitted)
3. Mumvumi, T. W., Chivavava, J. and Lewis, A. E**., Scoping study for Rare Earth Elements-containing wastewaters in South Africa, resource potential evaluation and preliminary assessment of extraction technologies**, Minerals, (Impact factor 2.2) (submitted)
4. Motsepe, L.A., Chivavava, J. and Lewis, A. E. 2023. **Investigating the effect of heat exchanger roughness and surface energy on scaling during eutectic freeze crystallization (EFC)**, Desalination (Impact factor 8.3) (submitted)
5. Chivavava, J., Petersen, J. and Lewis, A.E., 2024. **Comparing the recovery of rare earth elements from ion-adsorption clay leach solutions using various precipitants**, JSAIMM, Pages 737-745 (Impact factor 0.7)
6. Sussens, J., Chivavava, J. and Lewis, A. E. 2024. **The recovery of yttrium sulphate through antisolvent crystallization using alcohols**, Separation and Purification Technology,346, Pages 127459 (Impact Factor 8.1)
7. Mangunda, C.T., Petersen, J., Lewis, A.E. 2023. **Modification of Fe-O-OH Nanostructure via Structural Maturation: Implications for Dewatering Behaviour**, Journal of Environmental Chemical Engineering (submitted) (Impact factor 7.968)
8. Baloyi, T., Chivavava, J. and Lewis, A. E. 2023. **Investigation on the Effect of Mesomixing on Crystal Quality During Antisolvent Crystallization of Nd2(SO4)3·8H2O, Metals**, 2023, 13(8), 1378 (Impact factor 2.695)
9. Lewis, A.E., Chivavava, J., Motsepe, L., Nxiwa, B., Netshiomvani, K. and Zimu, N., 2023. **Novel Materials and Crystallizer Design for Freeze Concentration**, Scientific African, 20: e01593. (Impact factor 2.75)
10. Mehlo, B., Chivavava, J. and Lewis, A.E. 2023. **Comprehensive Characterization of selected South African brines**, Water SA, 49(2) 126–135. (Impact factor 1.586)
11. Sibanda, J., Chivavava, J. and Lewis, A.E. 2022. **Crystal Engineering in Antisolvent Crystallization of Rare Earth Elements (REEs)**, Minerals, 12(12): p.1554. (Impact Factor 2.404)
12. Spencer, A. Chivavava, J. and Lewis, A.E. 2022. **Effect of Heat Transfer Driving Force and Ice Seed Loading on the Production of Ice and Salt from a Dilute Brine Treated Using Eutectic Freeze Crystallization**, Minerals, 12(9): p. 1094. (Impact factor 2.665)
13. Chagwedera, T., Chivavava, J. and Lewis, A.E. 2022. **Gypsum seeding to prevent scaling,** Crystals, 12(3): p.342. (Impact factor 2.404)
14. Motsepe, L.A., Chivavava, J. and Lewis, A.E. 2022. **A novel, in-situ observation of the initial ice scale layer development on different heat exchanger surfaces during EFC**, Desalination, 522: p. 115404. (Impact factor 9.501)
15. Mangunda, C.T., Petersen, J. and Lewis, A.E. 2020. **Temperature-induced modification of the dewatering behaviour of Ferri-Oxyhydroxide precipitates formed from low tenor solutions,** Hydrometallurgy, 197: p. 105480. (Impact factor 2.85)
16. Aspeling, B., Chivavava, J. and Lewis, A.E. 2020. **Selective salt crystallization from a seeded ternary eutectic system in Eutectic Freeze Crystallization,** Separation and Purification Technology, 248: p. 117019. (Impact factor 5.107)
17. Harding, G., Chivavava, J. and Lewis, A.E. 2020. **Challenges and shortcomings in current South African industrial wastewater quality characterisation.** Water SA, 46: 267-277. (Impact factor 1.09)
18. Mangunda, C.T., J. Petersen, and Lewis, A.E. 2020. **Modifying the dewatering behaviour of iron solids from ferric sulphate solutions during lime treatment.** Hydrometallurgy, 191: p. 105238. (Impact factor 2.85)
19. Leyland, D., Chivavava, J. and Lewis, A.E. 2019**. Investigations into ice scaling during Eutectic Freeze Crystallization of brine streams at low scraper speeds and high supersaturation**, Separation and Purification Technology, 220:33-41. (Impact factor 3.927)
20. Mangunda, C., Petersen, J. and Lewis, A. 2019**. The Effect of Fe(III) Concentration on the Dewatering Behaviour of Fe(III) Oxyhydroxide Precipitates from Low-tenor Solution**s, Hydrometallurgy , 183: 20-28. (Impact factor 2.85)
21. Hubbe, M. A., Becheleni, E. M. A., Lewis, A. E., Peters, E. M., Gan, W., Nong, G., Mandal, S., and Shi, S. Q. 2018. **Recovery of inorganic compounds from spent alkaline pulping liquor by eutectic freeze crystallization and supporting unit operations: A Review**, BioRes. 13(4): 9180-9219. (Impact factor 1.32)
22. Maharaj, C., Chivavava, J. and Lewis, A.E. 2018. **Treatment of a highly concentrated multicomponent mining effluent using calcium hydroxide in a fluidised bed crystallize**r, Journal of Environmental Management, 207: 378-386. (Impact factor 2.197)
23. Becheleni, E., Rodriguez-Pascual, Ml, Lewis, A.E. and S.D. Rocha, 2017. **Influence of Phenol on the Crystallization Kinetics and Quality of Ice and Sodium Sulfate Decahydrate during Eutectic Freeze Crystallization**, Industrial and Engineering Chemistry Research, 56(41): 11926–11935. (Impact factor 2.0843)
24. Lewis, A.E., Zhang, Y., Gao, P. and Nazeeruddin, M.K., 2017. **Unveiling the concentration-dependent grain growth of perovskite films from one-and two-step deposition methods: implications for photovoltaic application**, ACS Applied Materials & Interfaces, 9(30): 25063-25066. (Impact factor 8.097)
25. Hasan, M., Filimonov, R., Chivavava, J., Sorvari, J., Louhi-Kultananen, M. and Lewis, A.E. 2017. **Ice growth on cooling surface of a jacketed and stirred Eutectic Freeze Crystallizer from aqueous Na2SO4 solution,** Separation and Purification Technology, 175: 512-526. (Impact factor 5.774)
26. Peters E., Chivavava, J., Rodriquez Pascual M. and Lewis A. 2016. **Effect of a phosphonate antiscalant during Eutectic Freeze Crystallization of a sodium sulphate waste stream,** Industrial and Engineering Chemistry Research, 55(35): 9378-9386. (Impact factor 3.573)
27. Gqebe, S., Rodriguez Pascual, M, Lewis, A.E., 2016. **Modification of the zeta potential of copper sulphide by the application of a magnetic field in order to improve particle settlin**g, JSAIMM, 116(6): 575-580 (Impact factor 1.632)
28. Hendricks, U., Rodriguez Pascual, M., Banfieid, J., and Lewis, A.E., 2015. **Measuring** **precipitation kinetics of** **sparingly soluble salts using shock-freeze TEM**, Journal of Crystal Growth, 432:108-115. (Impact factor 1.632)
29. Egan, T., Rodriguez Pascual, M. and Lewis, A.E., 2014. **In situ growth measurements of sodium sulphate during cooling crystallization**, Chemical Engineering and Technology, 37(8): 1283-1290. (Impact factor 1.630)
30. Chivavava, J., Lewis, A.E. and Rodriguez Pascual, M., 2014. **Effect of operating conditions on ice quality in continuous Eutectic Freeze Crystallization**, Chemical Engineering and Technology, 37(8): 1314-1320. (Impact factor 1.630)
31. Randall, D.G., Zinn, C and Lewis, A.E., 2014. **Treatment of textile wastewaters using Eutectic Freeze Crystallisation**, Water Science and Technology, 70(4): 736–741. (Impact factor 1.247)
32. Nduna, M., Lewis, A.E. and Nortier, P., 2014. **A model for the zeta potential of copper sulphide,** Colloids and Surfaces A: Physicochemical and Engineering Aspects, 441:643–652. (Impact factor 5.518)
33. Kapembwa, M., Rodroguez Pascual, M. and Lewis, A.E., 2014. **Heat and mass transfer effects of ice growth mechanisms in pure water and aqueous solutions**, Crystal Growth and Design, 14: 389-395. (Impact factor 4.558)
34. Apsey, G. and Lewis, A.E., 2013. **Selenium impurity in sodium sulphate decahydrate formed by Eutectic Freeze Crystallization of industrial waste brine**, Journal of the South African Institute of Mining and Metallurgy (JSAIMM) Special Edition, 113(5): 415-421. (Impact factor 0.31)
35. Nduna, M., Rodriguez Pascual, M. and Lewis, A.E., 2013. **Effect of dissolved precipitating ions on the settling characteristics of copper sulphide**, Journal of the South African Institute of Mining and Metallurgy (JSAIMM) Special Edition, 113(5): 435-439. (Impact factor 0.31)
36. Randall, D.G., Mohamed, R., Nathoo, J., Rossenrode, H. and Lewis, A.E., 2013. **Improved calcium sulphate recovery from a reverse osmosis retentate using Eutectic Freeze crystallization**, Water Science and Technology, 67(1): 139-146. (Impact factor 1.387)
37. Randall, D.G., Nathoo, J., Genceli-Guner, F.E., Kramer, H., Witkamp, G. and Lewis. A.E., 2013. **Determination of the metastable ice zone for a sodium sulphate system**. Chemical Engineering Science, 77: 184-188. (Impact factor 2.386)
38. Mokone, T.P., van Hille, R.P. and Lewis, A.E., 2012. **Effect of post-precipitation conditions on surface properties of colloidal metal sulphide precipitates**, Hydrometallurgy, 119–120:55-66. (Impact factor 2.169)
39. Mokone, T.P., Lewis, A.E. and van Hille, R.P., 2012. **Metal sulphides from wastewater: Assessing the impact of supersaturation control strategies**, Water Research, 46(7): 2088-2100. (Impact factor 11.236)
40. Bhikha, H., Lewis, A.E. and Deglon, D.A., 2011. **Reducing water consumption at Skorpion Zinc**, Journal of the South African Institute of Mining and Metallurgy (JSAIMM), 111: 437-442. (Impact factor 0.18)
41. Nortier, P., Chagnon, P. and Lewis, A.E., 2011. **Modelling the solubility in Bayer liquors: a critical review and new models**, Chemical Engineering Science, 66(12): 2596-2605. (Impact factor 4.311)
42. Lewis, A.E. and Mangere, M., 2011. **Reactive crystallization of copper selenide at very high supersaturation: a challenge to classical crystallization theory for sparingly soluble salts**, Chemical Engineering and Technology, 34(4): 517-524. (Impact factor 1.486)
43. Randall, D.G., Nathoo, J. and Lewis, A.E., 2011**. A case study for treating a reverse osmosis brine using Eutectic Freeze Crystallization - approaching a zero-waste process**, Desalination, 266(1-3): 256-262. (Impact factor 9.501)
44. Mangere, M., Nathoo, J. and Lewis, A.E., 2010. **Nucleation kinetics of selenium (+4) precipitation from acidic copper sulphate solution**, Journal of Crystal Growth, 312(21): 3178-3182. (Impact factor 1.797)
45. Lewis, A.E., 2010. **A review of metal sulphide precipitation**, Hydrometallurgy, 104: 222-234. (Impact factor 4.156)
46. Mokone, TP., van Hille, R.P. and Lewis, A.E., 2010. **Effect of solution chemistry on particle characteristics during metal sulphide precipitation**, Journal of Colloid and Interface Science, 351(1): 10-18. (Impact factor 8.128)
47. Lewis, A.E., Khodabocus, F., Dhokun, V. and Khalife, M., 2010. **Thermodynamic simulation and evaluation of sugar refinery evaporators using a steady state modelling approach**, Applied Thermal Engineering, 30(14-15): 2180-2186. (Impact factor 5.295)
48. Reddy, S.T., Lewis, A.E., Witkamp, G.J., Kramer, H.J.M. and van Spronsen, J., 2010. **Recovery of Na2SO4·10H2O from a reverse osmosis retentate by Eutectic Freeze Crystallization technology**, Chemical Engineering Research and Design, 88(9): 1153-1157. (Impact factor 3.739)
49. Andreassen, J.P., Flaten, E.M., Beck, R. and Lewis, A.E., 2010. **Investigations of spherulitic growth in industrial crystallization**, Chemical Engineering Research and Design, 88(9): 1163-1168. (Impact factor 3.739)
50. Lewis, A.E., Nathoo, J., Thomsen, K., Kramer, H.J., Witkamp, G.J., Reddy, S.T. and Randall, D.G., 2010. **Design of a Eutectic Freeze Crystallization process for multicomponent waste water stream**, Chemical Engineering Research and Design, 88(9): 1290-1296. (Impact factor 3.739)
51. Hove, M., van Hille, R. and Lewis, A.E., 2009. **The effect of different types of seeds on the oxidation and precipitation of iron**, Hydrometallurgy, 97: 180-184. (Impact factor 4.156)
52. Ntuli, F. and Lewis, A. E., 2009. **Kinetic modelling of nickel powder precipitation by high-pressure hydrogen reduction**, Chemical Engineering Science, 64(9): 2202-2215. (Impact factor 4.311)
53. McGeorge, B., Gaylard, P. and Lewis, A.E., 2009. **Mechanism of rhodium (III) co-precipitation with copper sulphide (at low Rh concentrations) incorporating a new cationic substitution reaction path**, Hydrometallurgy, 96: 235-245. (Impact factor 4.156)
54. Hove, M., van Hille, R. and Lewis, A.E., 2008. **Mechanisms of formation of iron precipitates from ferrous solutions at high and low pH**, Chemical Engineering Science, 63(6): 1626-1635. (Impact factor 4.311)
55. Karbanee, N., van Hille, R. and Lewis, A.E., 2008. **Controlled nickel sulphide precipitation using gaseous hydrogen sulphide**, Industrial and Engineering Chemistry Research, 47(5):1596-1602. (Impact factor 2.126)
56. Hove, M., van Hille, R.P. and Lewis, A.E., 2007. **Iron solids formed from oxidation precipitation of ferrous sulphate solutions**, AIChEJ, 53(10): 2569-2577. (Impact factor 1.801)
57. Chiang, Y-L., Nathoo, J. and Lewis, A.E., 2007. **Investigating the control of manganese sulphide precipitation**, Journal of the South African Institute of Mining and Metallurgy (JSAIMM), 107, April 2-12. (Impact factor 0.919)
58. Ntuli, F. and Lewis, A.E., 2007. **The influence of iron on the precipitation behaviour of nickel powder**, Chemical Engineering Science, 62(14): 3756-3766. (Impact factor 4.311)
59. Lewis, A.E., 2006. **Fines formation (and prevention) in seeded precipitation processes**, Kona, 24:119-125 (Invited contribution)
60. Ntuli, F. and Lewis, A.E., 2006. **The effect of a morphology modifier on the precipitation behaviour of nickel powder**, Chemical Engineering Science, 61(17): 5827-5833. (Impact factor 4.311)
61. Zhang, Y. and Lewis, A.E., 2006. **Effect of crystallization on the reaction kinetics of nickel reduction by hydrogen**, Chemical Engineering Science, 61(12): 4120-4125. (Impact factor 4.311)
62. Lewis, A.E. and van Hille, R.P., 2006. **An exploration into the sulphide precipitation method and its effect on metal removal,** Hydrometallurgy, 81:197-204. (Impact factor 4.156)
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87. Billing A.E. and Dold, P.L., 1988. **Modelling techniques for biological reaction systems: (2) Modelling of the steady state case**, Water S.A., 14(4): 193-206
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# Patents

1. Lewis, A.E. and Nathoo, J., 2011. “**Method of separating components out of a eutectic solution**” Patent granted in South Africa, ZA Patent No. 2011/01228, 26 October 2011; PCT Patent Application PCT/IB2009/006612. Australia (2009283940), Europe (09807969.2), South Africa (2011/01228), Canada (2,732,629).

# Books, Chapters In Books And Journals/Proceedings Authored and/or Edited

1. Lewis, A.E., 2024. **Fundamentals and practice of separations based on precipitation and crystallization in Hydrometallurgy,** in Seetharaman et al, (Eds) Treatise on Process Metallurgy, Second Edition, volume 2, (in press)
2. Lewis, A.E., Lorenz, H., Temmel, E. and Andreassen, J-P (Eds) 2022. **Special Issue: Recent Progress in Industrial Crystallization 2022**, Crystals, MDPI, [https://www.mdpi.com/journal/crystals/special\_issues/R\_P\_Industrial\_Crystallization](https://protect-za.mimecast.com/s/ltKFC3lr5wirEq5OuQKROi)
3. Lewis, A.E., and Stelzer, T., 2021. **Solid-Liquid Separation by Crystallization** in Olayinka Ogunsola and Isaac Gamwo (Eds) Solid Liquid Separation Technologies and Application to Produced Water, CRC Press
4. Lewis, A.E., Chivavava, J., du Plessis, J., Smith, D. and Smith, J-L.,2021. **Innovative Reactors for Recovery of Rare Earth Elements (REEs),** in Azimi, G., Oishi, T., Forsberg, K.M.M., Kim, H., Alam, S., Baba, A.A., and Neelameggham, N.R. (eds.), Rare Metal Technology 2021, The Minerals, Metals & Materials Series, <https://www.springer.com/gp/book/9783030654887>
5. Chivavava, J., Jooste, D., Aspeling, B., Peters, E., Ndoro, D., Heydenrych, H.R., Rodriguez Pascual, M. and Lewis, A.E., 2020. **Chapter 19: Continuous Eutectic Freeze Crystallization**, in Yazdanpanah, N. and Nagy, Z., The Handbook of Continuous Crystallization. 2020, The Royal Society of Chemistry. p. 508-541.
6. Lewis, A.E. 2019. Chapter 10.9: **Evaporation and** **Crystallization** in Dunne, R., S, Komar Kawatra., and Young, C. (Eds) **SME Mineral Processing and Extractive Metallurgy Handbook**, Society for Mining, Metallurgy and Exploration. pp 1293-1300. <https://smemi.personifycloud.com/PersonifyEbusiness/Store/ProductDetails.aspx?productId=2980623>
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8. Lewis, A.E., 2017. **Precipitation of Heavy Metals**, in Lens, P., Rene, E. Lewis. A.E and Sahinkaya, E. (Eds), Sustainable Heavy Metal Remediation: Volume 1: Sustainable Heavy Metal Remediation: Volume 1: Principles and Processes in Lichtfouse, E., Schwarzbauer, J., and Didier, R., Environmental Chemistry for a Sustainable World, Springer, pp101-120 <https://link.springer.com/book/10.1007/978-3-319-58622-9>
9. Andreassen, J-P and Lewis, A.E., 2017. **Classical and Nonclassical Theories of Crystal Growth,** in Van Driessche, A.E.S., Kellermeier, M., Benning, L.G. and Gebauer, D. (Eds), **New Perspectives on Mineral Nucleation and Growth,** From Solution Precursors to Solid Materials, Springer. pp137-154. <https://www.springer.com/gp/book/9783319456676>
10. Lewis, A.E., McMichael, L. and Glazewski J., 2016.  **Chapter 9: Water Quality, Fracking Fluids and Legal Disclosure,** in Glazewski, J., and S. Esterhuyse (Eds), [Hydraulic fracturing in the Karoo: Critical Legal and Environmental Perspectives,](https://juta.co.za/catalogue/hydraulic-fracturing-in-the-karoo-critical-legal-and-environmental-perspectives_24470) Juta and Co. pp245-263
11. Lewis, A.E., Seckler, M., Kramer, H.J.M. and van Rosmalen, G.M., 2015. **Industrial Crystallization: Fundamentals and Applications**, Cambridge University Press, pp1-320 <http://www.cambridge.org/9781107052154>
12. Ozinsky, A.E., 2010. Chapter 23: **Purple Reign**, **November 1989**. 1989: Democratic Revolutions at the Cold War’s End; A brief history with documents, Padraic Kenney. Bedford St. Martins ISBN 13: 978-0-312-48766-9, <http://kayspenard1989.blogspot.com/2013/09/chapter-5-south-africa-from-1983-1994.html>

# International Conferences Without Published Proceedings

1. *Lewis, A.E. and Hounslow, M.J., 2003.* ***Development and testing of phenomenological models and solution algorithms for the Crystallisation Research Tool****, US Department of Energy Crystallisation Project Team Meeting, Groton, Connecticut, USA, 18-19 September*
2. *Jawitz, J. and Lewis, A.E., 2001.* ***Using SOLO to assess understanding in a final year engineering design project****, First Electronic International Conference on Engineering Education, August*
3. *Butler, B.K. and Lewis, A.E., 2000.* ***Waste not, want not: metal precipitation from effluent streams****. Minerals Engineering 2000, Cape Town, 13 - 15 November*
4. *Guillard, D., Lewis, A.E. and Butler, B.K., 2000.* ***Nickel carbonate precipitation in a pellet reactor. Minerals Engineering 2000****, Cape Town, 13 - 15 November*
5. *Case, J., Gunstone R. and Lewis, A.E., 2000.* ***Approaches to learning in a Second Year Chemical Engineering Course****. American Education Research Association AERA Meeting, New Orleans, USA, April*
6. *Case, J., Gunstone R. and Lewis, A.E., 2000.* ***The impact of students’ perceptions on their metacognitive development: a case study****. American Education Research Association AERA Meeting, New Orleans USA, April*
7. *Case, J., Gunstone, R. and Lewis, A.E., 1999. Student perceptions of new approaches to teaching and assessment in an undergraduate chemical engineering course. 8th European Conference for Research on Learning and Instruction, Advancing Learning Communities In The New Millennium, Gothenburg, Sweden, 24-28 August*
8. *Case, J., Gunstone, R. and Lewis, A.E., 1999.* ***Mapping students' metacognitive development****. 30th Annual Conference of the Australasian Science Education Research Association (ASERA), Rotorua, New Zealand, 8 -11 July*
9. *Case, J., Jawitz, J., Lewis, A.E. and Fraser, D.M.F., 1999.* ***Cover Less, Uncover More: A Case Study in 2nd Year Chemical Engineering****. SA Association of Researchers in Maths and Science Education conference, (SAARMSE), Harare, 13-16 January*

# Popular Contributions/Science Engagement

1. Lewis, A.E., 2023. **Precipitation and Crystallization,** Co-lectured five-day course in Advances in Crystallization and Crystal Characterization Techniques, Aalto University School of Chemical Engineering, Espoo, Finland, 8-12 August 2023
2. Lewis, A.E., 2020. **Precipitation**, Five-day course in Advances in Crystallization and Crystal Characterization Techniques, Aalto University School of Chemical Engineering, Espoo, Finland, online 1 June 2020
3. Lewis, A.E., 2018. **Talk and demonstration** to Silverlea Primary, Athlone. 23 May
4. Lewis, A.E., 2018. **Eutectic Freeze Crystallization, and why we should be cool about it…**, University of the Third Age, Natural Sciences Group, Meadowridge, Cape Town. 12 March 2018.
5. Lewis, A.E., 2018. **From Crisis to Leader: Beyond the Crisis,** Panellist at the #Co-Create Design Festival Conference, East City, Cape Town. 22-24 February 2018, <http://cocreatesa.nl/cocreatedesign-festival-speakers/>
6. Lewis, A.E., 2018. **Turning scepticism into success: a chilling waste solution**., Green Mining: Beyond the Myth, published by Anglo Gold Ashanti/Minerals to Metals/Mineral Law in Africa. January 2018, <https://twitter.com/mtmuct>
7. SuperUser., 2018. **Adelaide Desalination Plant – tips for Cape Town?** 23 January 2018, Cape Business News, <http://www.cbn.co.za/news/adelaide-desalination-plant-tips-for-cape-town>
8. Lewis, A.E., 2017. **Eutectic Freeze Crystallization**. Water Institute of Southern Africa: Advanced Technical Workshop on Water Treatment, Aurecon, 10 March.
9. Steenkamp, T., 2017. **Squeezing last drop out of mine wate**r., 20 Aug 2017, Sunday Times, <https://www.timeslive.co.za/sunday-times/news/2017-08-19-squeezing-last-drop-out-of-mine-water/>
10. Lewis, A.E. 2017. **From crazy to conquest – a chilling waste solution,** Leadership magazine, November 2017, <http://www.leadershiponline.co.za/articles/from-crazy-to-conquest-a-chilling-waste-solution-24224.html>
11. Chambers, D., 2017. **Pure genius! UCT's mine wastewater solution could also aid desalination.** 11 July 2017. Times Live, <https://www.timeslive.co.za/news/south-africa/2017-07-11-pure-genius-ucts-mine-wastewater-solution-could-also-aid-desalination/>
12. Wild, S., 2016. **At the heart of Eskom’s vast network is a strategic hub that keeps things running.** 20 Aug 2016, Mail and Guardian, <https://mg.co.za/article/2016-08-30-00-at-the-heart-of-eskoms-vast-network-is-a-strategic-hub-that-keeps-things-running>
13. Creamer, T., 2016. **Eskom aiming to ‘freeze’ pollution from power station and mine wastewater streams**. 22 January 2016. Engineering News, <http://www.engineeringnews.co.za/article/eskom-aiming-to-freeze-pollution-from-power-station-and-mine-wastewater-streams-2016-01-22>
14. Lewis, A.E. 2015. Popular talk: “**Eutectic Freeze Crystallization, and why we should be cool about it…”,** The Astronomical Society of Southern Africa (ASSA), Garden Route Centre, 18 July 2015
15. Lewis, A.E., 2014. **Modern Alchemy: Turning toxins into treasure,** Café Scientifique, Irma Stern Museum, Rosebank, Cape Town, 3 June 2014, <http://www.youtube.com/watch?v=aDPPwJxjUL4>
16. Lewis, A.E., 2014. **Modern Alchemy,** BBC World Service - The Forum, Radio program, London, England, 15 January 2014, **Radio broadcast** <http://www.bbc.co.uk/iplayer/episode/p01q5cg6/The_Forum_Modern_Alchemy>/
17. Lewis, A.E., 2012. **Visions for Chemical Engineering**, Lappeenranta University of Technology, Video recording, <http://www.youtube.com/watch?v=E332uTutP2E>
18. Lewis, A.E., 2012. **Change the world and study Chemical Engineering**, Lappeenranta University of Technology, Video recording, <http://www.youtube.com/watch?v=G-qQo8_6Drg>
19. Lewis, A.E., 2011. **Be bold and mighty forces will come to your aid**, TEDX, Cape Town, Ratanga Junction, Canal Walk, Western Cape, April 2011 <http://www.youtube.com/watch?v=lWsqSRos1LY>

# Research Supervision

## ****Postgraduate Graduated:****

1. Johnathan Sibanda, **Crystal Engineering in Antisolvent Crystallization of Rare Earth Elements (REEs**), MSc, 2023
2. Anotidaishe Dondo, **Consistent production of both ice and salt in EFC**, MSc, 2023
3. Taona Chagwedera, **Seeding to prevent gypsum scaling in EFC,** MSc, 2021
4. Lerato Motsepe, **Crystal Engineering in Eutectic Freeze Crystallization,** MSc, 2020 (with distinction)
5. Brenda Mehlo, **Brine systems and characterisation**, MSc, 2020
6. Senzo Mgabhi, **The hydrated lime dissolution kinetics in acid mine drainage neutralization,** MSc, 2020
7. Cledwyn Mangunda, **An Investigation into Fe (III) Oxyhydroxide Precipitation in Lime Neutralization Processes,** PhD, 2020
8. Edmund Engelbrecht, **Production scale semi-batch rhodium-DETA precipitation model,** PhD, 2019
9. Benita Aspeling, **Yield and purity of salts recovered in a multi-component system using Eutectic Freeze Crystallization**, MSc, (with distinction), 2019
10. Genevieve Harding, **South African industrial effluents and their characterisation**, MSc, 2018.
11. Debbie Jooste**, Ice scaling in continuous Eutectic Freeze Crystallization**, MSc, June 2016 (with distinction)
12. Chiara Maharaj, **Treatment of a multicomponent mining effluent using calcium hydroxide in fluidized bed crystallizer**, MSc, June 2016
13. Sibongiseni Gqebe, **Improving the settleability of a metal sulphide suspension by the application of a magnetic field,** MSc, December 2015
14. Edward Peters, **Effect of antiscalants during Eutectic Freeze Crystallization of a reverse osmosis retentate**, MSc June 2015
15. Vuyiswa Dube, Study of selective removal of CoS and NiS during purification of MnSO4, MSc June 2015
16. Emily Mayer, Case study for an economical evaluation of Eutectic Freeze Crystallization and Evaporative Crystallization for a Brazilian refinery waste stream, PhD, December 2015
17. Brian Willis, Development of measurement techniques for aggregation in precipitation systems, MSc, June 2014
18. Tim Egan, Factors affecting the incorporation of impurities during cooling crystallisation, MSc, December 2013
19. Jemitias Chivavava, Effect of operating conditions on product quality in continuous Eutectic Freeze Crystallization, MSc, December 2013
20. Michael Kapembwa, Heat and mass transfer effects of ice growth mechanisms in water and aqueous solutions, MSc, June 2013
21. Moses Nduna, Post precipitation treatment of CuS particles to improve settleability, MSc, June 2013
22. Emily Musil, Developing methods to measure the precipitation kinetics of sparingly soluble systems, MSc, December 2011
23. Grant Apsey, Impurities in crystals formed by Eutectic Freeze Crystallization, MSc, December 2011
24. Nobert Paradza, An investigation into the suspension, attrition and breakage of nickel crystal during the nickel reduction process, MSc, June 2011
25. Rinesh Jivanji, Industrial application of Eutectic Freeze Crystallization, MSc, June 2011
26. Cornelia Ras, An industrial ecology approach to salts-related, environmental sustainability problems in a large, inland industrial complex, MSc, June 2011
27. Thebe Mokone, Metal sulphide precipitation: effect of operational parameters on particle characteristics and process efficiency, PhD, December 2010
28. Dyllon Randall, Development of a brine treatment protocol using Eutectic Freeze Crystallization, PhD, December 2010
29. Premesh Govan, Measurement and modelling of solubility data for sparingly soluble precipitation systems, MSc, December 2010
30. Botlhe Mokgethi, Investigation of crystallization kinetics in a turbulent environment, MSc, December 2010
31. Yu Lun Chiang, Antisolvent gibbsite crystallization from synthetic Bayer liquor, MSc, June 2010
32. Murehwa Mangere, Investigation into the kinetics, mechanisms and particle characteristics of selenium precipitation from copper sulphate solution, MSc, June 2010
33. Ndisha Mbedzi, An investigation into the removal of aluminosilicates scaling species by activated alumina, MSc, June 2010
34. Lindizwe Zibi, Industrial brine characteristics and modelling, MSc, June 2010
35. Rendani Ramaru, Struvite precipitation in a fluidised bed reactor, MSc, December 2009
36. Harshad Bhika, Technological challenges in mineral processing and extractive metallurgy, MSc, June 2009
37. Mfandaidza Hove, Iron precipitation in acid mine drainage, PhD, December 2008
38. Freeman Ntuli, Mechanisms of precipitation in the reduction of nickel via hydrogen, PhD, December 2008
39. Barry McGeorge, **Mechanisms of rhodium precipitation**, MSc, December 2007
40. Nazneen Karbanee, Investigation into the precipitation of mixed cobalt and nickel sulphides, MSc, June 2007
41. Celo Mausse, Population balance modelling in nickel reduction systems, MSc, December 2006
42. Aoyi Ochieng, A hydrodynamic study of nickel suspension in stirred tanks, PhD, December 2005
43. Ashton Swartbooi, Cobalt and nickel sulphide precipitation in a fluidised bed reactor, MSc, December 2005
44. Venusan Pillay, The simulation of electrolyte systems: the system K-Na-Mg-Cl-SO4-H2O, MSc, December 2004
45. Jeeten Nathoo, Optimisation of electrolyte composition and operating parameters for the electropolishing of 304 stainless steel, MSc, December 2003
46. Shilpa Seewoo, Morphology control in gypsum precipitation, MSc, December 2003
47. Karen Peterson, Copper sulphide precipitation for treatment of acid mine drainage, MSc, December 2002
48. Craig Beautement, Treatment of secondary lead slag for environmental protection, MSc, June 2001
49. Damien Guillard, Nickel carbonate precipitation in a fluidised bed reactor, MSc, December 2001
50. Jonathan Centurier-Harris**, Studies in the crystallisation behaviour of potassium nitrate**, MSc (co-supervised with Prof G van Rosmalen, TU Delft, Netherlands), December 2000
51. Antony Knobel, A mathematical model of a high sulphate wastewater anaerobic treatment system, MSc, December 1999
52. Leonore Cairncross, **Simulation of ionic precipitation of metal hydroxides from industrial waste water**, MSc (co-supervised with Prof JG Petrie, University of Sydney), December 1998
53. Alex Pehlken**, Investigation into treatment of secondary lead slag**, University of Aachen, Diplomarbeit, December 1997

# Post-Doctoral Fellows supervised

* Dr QinHai Li, PhD Chinese Academy of Science, Institute of Salt Lakes, XiNing, Qinghai Province, China, 2018
* Dr Sivapregasen Naidoo, PhD Western Cape, South Africa, 2010
	+ Dr Gillian Balfour, PhD Cape Town, South Africa, 2007 and 2008
	+ Dr Vinit Mishra, PhD New Delhi, India, 2007
	+ Dr Christian Taty Costodes, PhD Paris, France, 2004 and 2005
	+ Dr YiFei Zhang, PhD Beijing, China, 2004 and 2005
	+ Dr Rob van Hille, PhD Rhodes, South Africa, 2002, 2003 and 2004
	+ Dr Stella Lacour, PhD Limoges, France, 2001
	+ Dr Bronwen Butler, PhD Queensland, Australia, 2000

# Currently supervised:

* Bridget Mushava, **Novel materials and directed crystal engineering for continuous Eutectic Freeze Crystallization applications**, MSc
* Muvhulawa Mulaudzi, **Optimisation and redesign of water treatment processes to facilitate effective removal of CECs in the production of potable water,** PhD
* Senzo Mgabhi, **The Effect of Pressure in the Recovery of Manganese Carbonate using Carbon Dioxide and Aqueous Ammonia as Reagents,** PhD
* Thabo Sibanda, **Using CO­2 for MnCO3 precipitation processes**, MSc
* Madimetsa Matau, **Novel materials and directed crystal engineering for continuous EFC,** MSc
* Tawanda William Mumvumi, **Innovative processes for Rare Earth Element recovery from wastewater**, MSc
* Buhle Nxiwa, **Novel crystallizer designs for EFC**, MSc
* Tinjombo Baloyi, **REE recovery from synthetic NiMH battery sulfuric acid leach liquors: testing mixing,** MSc
* Hilton Heydenrych, **Systematic comparison of the effectiveness of water treatment processes**, PhD
* Max Pelser, **Scale-up of the reactive precipitation of Nickel Hydroxide to industrial application,** PhD
* Jacolien Du Plessis, **Antisolvent precipitation of rare earth elements from waste streams using a fluidised bed reactor**, PhD
* Jemitias Chivavava, R**ecovery of rare earth elements from waste streams**, PhD

# Honours Level

* Alexi Shaff and Ross Savage, A study into the utilisation of CO2 nanobubbles for precipitation of MnCO3 from industrial pregnant leach solutions, 2024.
* Mirriam Gurajena and Sihle Zuma, Investigating feasibility of using freeze crystallization for enrichment of lithium in brines, 2024.
* Khensani Langa and Nyengedzo Maliboho, Continuous EFC of a South African industrial brine using polypropylene graphite, (Final Mark 66%), 2023.
* Tariro Madziya and Taniel Padayachee, Investigating the impact of post-precipitation conditions on the quality of Rare Earth Element (REE) carbonates, (Final Mark 74%), 2023.
* Thabang Otto Shamukuni and Ntandoyenkosi Ndlovukazi, Observing the ice scaling mechanism on the heat exchanger surface during continuous Eutectic Freeze Crystallization, (Final Mark 73%) 2022
* Makokorope Maswinyaneng and Thadious Masangano, The effect of impeller type on the production of ice and salt in continuous EFC, (Final Mark 74%), 2022
* Verushka Snyders and Bothselo Brandon Tidimalo, Understanding the effect of hydrodynamics on the quality of precipitated rare earth element carbonates, (Final Mark 72%), 2021
* Karabo Netshiomvani and Njabulo Zimu, Investigating ice scaling on a novel material of construction for Eutectic Freeze Crystallization, (Final Mark 71%), 2021
* Phendulwa Nondonga and Mbhoni Rikhotso, **Lithium recovery from brines using EFC**, (Final Mark 67%), 2020
* Siphesihle Jwara and Ronaldo Ndlovu, Identifying crystallization mechanisms in recovery of Rare Earth Element [REE] from leach liquors using antisolvent crystallization, (Final Mark 62%), 2020
* Brandon Douwie and Kylie Wan, Modelling of selective recovery of REE from leach liquors using precipitation, (Final Mark 79%), 2020
* Dane Smith and Jody Smith, Effect of hydrodynamics on Rare Earth Element [REE] recovery from wastes, (Final Mark 75%), 2019
* Abdul-Malik Lottering and Shurah Mohammed Sheikh, Size, shape and purity of ice crystals in Eutectic Freeze Crystallization [EFC], (Final Mark 63%), 2019
* Sheena Bemanya and Ashley Mwendia, Size, shape and purity of salt crystals in Eutectic Freeze Crystallization [EFC], (Final Mark 68%), 2019
* Matthew Shaw and Terri-Anne Glass, Carbonate precipitation for calcium removal from multi-component saline solutions, (Final Mark 79%), 2019
* Aaron Smith and Divine Ssebunnya, Treatment of Reverse Osmosis brines using calcium precipitation to prevent scaling in Eutectic Freeze Crystallization treatment, (Final Mark 77%), 2018
* Julius Manjo, **Interaction of solids fraction, Reynolds number and temperature driving force in ice scaling in Eutectic Freeze Crystallization**, (Final Mark 55%), 2018
* Fendi Lin and Anthony Mchendrie, **Eutectic Freeze Crystallization for seawater**, (Final Mark 70%), 2017
* Nogues Ollier and Kreelan Chetty, **Treatment technologies for recycling effluent at an oil refinery**, (Final Mark 73%), 2017
* Sinethemba Mhlongo and Bonolo Bonokoane, **Eutectic Freeze Crystallization for treatment of highly saline brines generated by extraction as part of CO2 storage pressure management**, (Final Mark 65%), 2017
* Lorraine Dzimbanhete and Amulya Mathew, **Kinetics of hydrated lime dissolution in the neutralization of acid mine drainage (AMD) using a continuous flow reactor**, (Final Mark 80%), 2017
* Gachoki Tracy Mbiyu and Zipporah Nyokangi, **Transformation of metastable Fe(III) oxyhydroxide precipitates in the treatment of AMD**, (Final Mark 71%), 2016
* Linda Foster and Delisha-Ann Naicker, **Kinetics of perovskite formation and crystallization**, (Final Mark 71%), 2016
* Sarah Adam and Julia McGregor, **Comparison of a heating crystallization with a cooling** **crystallization process for calcium sulphate removal from a multicomponent brine**, (Final Mark 79%) 2015
* Lelethu Beseti and Reuben Dlamini, **Effects of Feed Flow Rate and Concentration on Ferric Sulphate Oxyhdroxide Precipitate Formation**, (Final Mark 69%) 2015
* Chabala Kaongwa and Queen Rugaimukama, **Factors affecting scale formation in EFC**, (Final Mark 67%) 2015
* Jade Holt and Rosalind Stegman, **Economic comparison of gypsum precipitation in FBC versus an MSMPR**,(Final Mark 57%) **2015**
* Sizwe Vidima and Bagcinele Dlamini, **In situ investigation of calcium sulphate scaling in a test cell**, (Final Mark 63%) 2014
* Amir Mohd Fauzi and Arthur Gajewski, **Optimised heat integration for a combined Reverse Osmosis and Eutectic Freeze Crystallization Process**, (Final Mark 84%) 2014
* Tesha Seeparsad and Chiara Maharaj, **Comparison of a Reverse Osmosis/Eutectic Freeze Crystallization process with a cycled Reverse Osmosis-Cooling Crystallisation process**, (Final Mark 84%) 2014
* Buhle Manana and Pfano Nembudani, **Eutectic Freeze Crystallization for treatment of textile waste concentrates**, (Final Mark 68%) 2014
* Piniel Bengesai and Hiren Makkan, **Stripping of ammonia from alkaline brine using a novel oscillating multi-grid reactor**, (Final mark 74%) 2013
* Nicholas Fleischman and Megan Raymond, **Effect of antiscalants on the solubility, yield and purity of the products in an Eutectic Freeze Crystallization process**, (Final mark 79%) 2013
* Relebohile Molaoa and Relebohile Sefako, **Treating heap leach acid using an Eutectic Freeze Crystallization process**, (Final mark 65%) 2013
* Sibongiseni Gqebe and Faith Ndzimandze, **Modelling and comparison of acid mine drainage treatment processes**, (Final mark 65%) 2013
* Firdous Alexander and Daniella Faria, **Economical and environmental evaluation of Eutectic Freeze Crystallization vs. reverse osmosis for water treatment**, (Final mark 73%) 2013
* Shadley Martin and Ayesha Rawoot, **Flow modelling of Eutectic Freeze Crystallization for multi-component brines**, (Final mark 73%) 2013
* Caitlin Moir and Kelly Brokelmann, **Determination of crystal defects and liquid-gas inclusions due to degasification bubble formation during cooling crystallization**, (Final mark 81%) 2012
* Alice Wong and Thilisha Moodley, **Using an alkaline mine wastewater for CO2 sequestration**, (Final mark 59%) 2012
* Mesuli Zondo and Sarvesha Moodley, **FeS slurry for acid mine drainage treatment**, (Final mark 83%) 2012
* Mohamad Omar and Marasi Monyau, **Sulphate recovery from acid mine drainage**, (Final mark 73%) 2012
* Zethu Dlamini and Nicole Gounder, **Effect of morphology and crystal size distribution on gravitational separation during Eutectic Freeze Crystallization,**(Final mark 68%) 2012
* Estelle Mills and Andrew Payne, **Heat/mass transfer measurements during Eutectic Freeze Crystallization**, (Final mark 88%), 2011
* Rizqah Mohamed and Hilton Rossenrode, **Investigating the characteristics of scaling salts using Eutectic Freeze Crystallization**, (Final mark 87%), 2011
* Sairisha Ramnanan and Catherine Lukwayo, S**alt purity in Eutectic Freeze Crystallization**, (Final mark 76%), 2011
* Marc Bagley and Craig Zinn, **Recovery of dyes and salts from textile wastewaters using Eutectic Freeze Crystallization,** (Final mark 65%), 2011
* Alex Madden and Mark Middelhoven, **Manipulating crystallization temperatures in Eutectic Freeze Crystallization**, (Final mark 64%), 2010
* Wade Swannell and Matthew Amundsen, **Isotropic turbulence and its effect on precipitation processes**, (Final mark 53%), 2010
* Emily Musil and Nerisa Moodley, **Manganese purification by seeded precipitation**, (Final mark 74%), 2009
* Karen Ma, and Paul Mphengwa Mabala, **Control of particle characteristics in NiS precipitation,**(Final mark 64%), 2009
* Muneer Asmal and Rinesh Jivanji, **Brine analysis and modellin**g, (Final mark 80%), 2008
* Saud Edries and Niven Harku, **Eutectic Freeze Crystallization**, (Final mark 72%), 2008
* Lauren Miller and Mitesh Chuahan, **Spherulitic growth**, (Final mark 80%), 2008
* John Terreblanche and Matthew Fry, **Investigating selective removal of cationic scaling species from gas liquor using alumina**, (Final mark 80%), 2007
* Motlatsi Mabaso & Rendani Ramaru, **Removal and recovery of metal salts from acid mine drainage and industrial effluents**, (Final mark 67%), 2007
* Yu-Lun Chiang and Fabian Petersen, **Seeded precipitation for impurity removal**, (Final mark 75%), 2006
* Michelle Bennet and Premesh Govan, **Brine treatment for water recovery**, (Final mark 79%), 2006
* James Vardy and Sean Knight, **Metal removal from acid mine drainage**, (Final mark 67%), 2006
* Sarashnee Reddy and Lynn Mortinson, **Scaling in solar water heaters**, (Final mark 64%), 2005
* Cello Mausse and Keabetswe Molala, **The population balance as a tool for understanding crystallization**, (Final mark 72%), 2004
* Nazneen Karbanee and Bianca Carlse, **Chemical processing of novel anti-malarial drugs**, (Final mark 77%), 2004
* Eugene Delport and Thehzeeb Akbar, Effect of macromixing time on sodium bicarbonate precipitation (Final mark 65%), 2003
* Hermita Anand and Bo Robertse, **Sodium bicarbonate precipitation,**(Final mark 75%), 2002
* Angela Storey and Tamlyn Foster, **Mixed metal precipitation for treatment of acid mine drainage**, (Final mark 81%), 2002
* Jeeten Nathoo and Shilpha Seewoo, **The SPARRO process for desalination of calcium sulphate scaling waters**, (Final mark 79%), 2001
* Kar Luk and Ashton Swartbooi, **Performance of a multi impeller reactor for nickel precipitation**, (Final mark 76%), 2001
* Punish Chikowero and Lerato Motsilanyane, **Commissioning of a high pressure vessel for nickel precipitation**, (Final mark obtained: 64%), 2000
* Lasath Punyandeera, **Promoting size enlargement by reactor design,**(Final mark 51%), 2000
* Kelly Petersen and Mandy Roberts, **Characterisation of calcium oxide crystallization processes using a multiple technique approach**, (Final mark 73%), 2000
* Kenneth Kamurasi and Edward Theka, **Precipitation for removal of metals from acid mine drainage**, (Final mark 63%), 2000
* Thabo Kgogo and Semano Sekatle, **Promoting mixing to control nucleation in precipitation systems**, (Final mark obtained: 75%), 2000
* Glodina Gordon and Tessa Meyer, **Solids formation by precipitation in mineral processing streams**, (Final mark 66%), 1999
* Sarah Bross and Catherine Van Hoogstraten, **Recovery of elemental sulphur from soluble sulphides**, (Final mark 71%), 1999
* Kim Palmer and Jonathan Centurier-Harris, **Characterisation and assessment of hazardous waste**, (Final mark 81%), 1998
* Motshewa Matimolane and Thuto Mosholi, **Recovery of elemental sulphur from soluble sulphides**, (Final mark 61%), 1998
* Craig Beautement and Pathmenadin Padayachee, **Treatment of secondary lead waste for environmental protection**, (Final mark 63%), 1997
* Bruce Souter and Peter Fiene, **Modelling of a proposed process for the treatment of acid mine drainage**, (Final mark 74%), 1997
* Michael Dalby and Murray Roos, **Modelling of biological systems** (co-supervised), (Final mark 73%), 1996
* David Sekgorowane and Bethuel Legabe, **Fundamentals of ionic precipitation of metal hydroxides** (co-supervised), (Final mark 55%), 1996

# Scholarly Activities

* Served as NRF SARChI Chair Postal Reviewer: DSI-NRF\_UFH Research Chair in Solar Energy, Prof. Edson Meyer, University of Fort Hare
* Peer reviewer on the evaluation of proposals from: the 2021 Millennium Institutes in Natural/Exact Sciences, and/or the Fourth Call for National Basal Funding for Scientific and Technological Centres of Excellence 2021.  Both Programs are coordinated by the National Agency of Research and Development - ANID (Ex CONICYT), the equivalent of the NSF in the United States.
* international member of the assessment committee for a tenure track position: Associate Professor in Particle Engineering and Hydrometallurgy within Chemical Engineering, Department of Chemical Engineering, Norwegian University of Science and Technology, Trondheim, Norway
* Academic reference group for "Green Recycling of Battery Materials by Deep Eutectic Solvents" at KTH Royal Institute of Technology and Uppsala University, funded by the Swedish Energy Agency, 2020
* Member of the Royal Academy of Engineering Steering group for Higher Education Partnerships in sub-Saharan Africa (HEPSSA), 2020
* Expert evaluator for KTH Royal Institute of Technology, Assistant Professor: Department of Chemical Engineering, 2020
* External Assessor for tenure of Prof. Gisele Azimi, Departments of Chemical and Applied Chemistry and Materials Science and Engineering, University of Toronto, 2018
* External Assessor for Prof. Eoin Casey, School of Chemical and Bioprocess Engineering, University College Dublin, 2018
* Project Innovation Awards Judging Panel for the International Water Association, Tokyo, 2018
* Selection Committee Member for the University of Johannesburg, Executive Dean: Faculty of Engineering and the Built Environment, 2018
* University of Fort Hare: Inauguration of The Chancellor and Vice Chancellor, 2017
* Leading Complex change workshop sponsored by USAf (19 – 20 October 2017)
* External reviewer on behalf of the Chilean National Commission for Science and Technology (CONICYT) for funding proposals (2017) and for funding proposals and Centre Reviews (2018)
* Member of the Scientific Committee for the International Symposium on Industrial Crystallization (ISIC), since 2009
* Member of the Scientific Committee for the Bremen International Workshop on Industrial Crystallization (BIWIC), since 2006, incl 2017
* Referee for AIChEJ, ACS Omega, Biotechnology & Bioengineering, Chemical Engineering and Processing, Chemical Engineering Science, Chemosphere, Crystal Growth & Design, Desalination, Environmental Technology, Hydrometallurgy, Industrial and Engineering Chemistry Research, JOM, Journal of Chemical & Engineering Data, Journal of Crystal Growth, Journal of Food Engineering, Journal of Materials Research and Technology, Journal of the Southern African Institute of Mining and Metallurgy, Journal of Water Processing, Powder Technology, Separation and Purification Technology, SME, Water Environment Research, Water Research, Water SA
* Appointed to the Minister’s to Selection Panel for South African Water Boards, Trans Caledon Tunnel Authority Board and Water Research Commission Board, July 2015

## External Examination of Postgraduate Theses

* PhD thesis, Aalto University, Finland, 2023 Nahla Osmanbegovic, Freeze concentration with biorefinery applications.
* PhD thesis, Lappeenranta University of Technology, Lappeenranta, Finland, 2020. Miia John, Separation efficiencies of freeze crystallization in wastewater purification.
* PhD thesis, University of British Columbia, Canada, 2013. Mohammad Mokmeli, Kinetics study of selenium and tellurium removal from copper sulphate-sulphuric acid solution.
* PhD thesis, University of Wageningen/UNESCO-IHE, Delft, The Netherlands, October 2013. Denys Kristalia Villa Gomez, Simultaneous sulphate reduction and metal precipitation in an inverse fluidized bed reactor.
* PhD thesis, University of Toronto, Toronto Canada, February 2010. Gisele Azimi, Evaluation of the potential of scaling due to calcium compounds in hydrometallurgical processes.
* PhD thesis, Royal Institute of Technology, Stockholm, June 2009. Kirsten Forsberg, Crystallization of metal fluoride hydrates from mixed acid solutions.
* MSc thesis, North West University, May 2009. D.J. Branken, Separation of Zr and Hf via fractional crystallization of K2Zr(Hf)F6: A theoretical and experimental study.
* PhD thesis, University of Pretoria, 2004
* MSc thesis, University of Stellenbosch, January 2003.
* MTech thesis, Cape Technikon, March 1998

# Continuing Education

* Lewis, A.E., 2015. “Introduction to EFC and to aqueous chemistry modelling”, Course for Eskom participants, Eskom Research Centre, Rocheville, Gauteng, March 2015
* Lewis, A.E., 2014. “Understanding crystallization & precipitation processes”, Course for industrial participants, Isisango Conference Centre, Midrand, Gauteng, March 2014
* Lewis, A.E., 2011. Solids suspension, attrition and breakage, Presentation to Plant Personnel at Murrin Murrin, Australia, March 2011
* Lewis, A.E., 2011. Fundamental aspects of nickel reduction, Presentation to Plant Personnel at Murrin Murrin, Australia, March 2011
* Lewis, A.E., 2011. Factors affecting gypsum morphology, Presentation to Plant Personnel at Murrin Murrin, Australia, March 2011
* Lewis, A.E., 2011. Crystallisation and precipitation’, Presentation to University of Stellenbosch, Faculty of Heath Sciences, Department of Biomedical Sciences, Stellenbosch, May 2011
* Lewis, A.E., Manganese Metal Company, 2010. Challenges in sulphide crystallization, MMC Offices, Nelspruit, Mpumalanga, February 2010
* Lewis, A.E., 2009. “Understanding industrial crystallization processes”, Course for Exxaro - Zincor delegates at Zincor offices, Springs, Gauteng, October 2009
* Lewis, A.E., 2007. “Understanding crystallization & precipitation processes”, Course for industrial participants in association with TU Delft (Prof GM van Rosmalen) Isisango Conference Centre, Midrand, Gauteng, March 2007
* Lewis, A.E., 2006. “Understanding an industrial purification process”, course for industrial participants, Manganese Metal Company, Nelspruit, February 2006
* Lewis, A.E., 2005. “Precipitation for metal recovery and removal in hydrometallurgical processes”, Presentation to Hydrometallurgy course for industrial participants, University of Cape Town, Jan/Feb 2004 and Jun/July 2005
* Lewis, A.E., 2004. “Industrial precipitation and crystallisation”, Course for industrial and academic participants in collaboration with Prof M Seckler of the Institute for Technological Research (IPT), Cidade Universitária, Sao Paulo, Brazil, November 2004
* Lewis, A.E., 2004. “Crystallisation and precipitation as rate controlled molecular separations”, SEPSA Separation Technology week, Potchefstroom University, Gauteng, November 2004
* Lewis, A.E., 2004. Association for Crystallisation Technology, 13th Larson Workshop, Chicago Illinois, USA, one of 38 invited and funded academic delegates, October 2004
* Lewis, A.E., 2004. “Precipitation: Understanding, optimisation and design”, course for industrial participants, Zincor, Springs, Gauteng, September 2004
* Lewis, A.E., 2004. “Crystallisation and precipitation: Theory and practice”. Course for industrial participants in association with TU Delft (Prof GM van Rosmalen) Isisango Conference Centre, Midrand, Gauteng, April 2004
* Lewis, A.E., 2001. “Controlling precipitation processes”, Convenor of 3-day course presented at Glenburn Lodge, Gauteng; in collaboration with Prof GM van Rosmalen and A/Prof HM Kramer of Delft Technical University, The Netherlands, March 2001

# Other Research/Technical Activities

* Chivavava, J. Heydenrych, H.R. and Lewis, A.E., 2021. Commercialisation of Eutectic Freeze Crystallization: Mini Plant Test Rig for Demonstration and Development Purposes, WADER deliverable.
* Motsepe, L., Chivavava, J and Lewis, A.E., 2019. **Unlocking Obstacles to Commercialization of EFC**, Coaltech Technical Report; 2019 and 2020.
* Lewis, A.E. and Chivavava, J. 2019. Reducing water and wastewater treatment costs through development of new crystallizer designs for Eutectic Freeze Crystallization processes, Electrical Power Research Institute (EPRI) Technology Innovation Program, United States of America, Technical Report.
* Lewis, A.E. Nathoo, J., Reddy, T., Randall, T., Zibi, L. and Jivanji, R., 2010. **Novel Technology for Recovery of Water and Solid Salts from Hypersaline Brines: Eutectic Freeze Crystallisation,** K5 1727 - WRC Research Project 2007 – 2009
* Randall, D., Lewis, A.E., Rodriguez-Pascual, M., Nathoo, J., Reddy, T., Apsey, G., Kapembwa, M., Egan, T and Chivavava, J., 2013. **Extended Investigations into Recovery of Water and Salts from Multi-component Hypersaline Brines using Eutectic Freeze Crystallization,** K5/1727 - WRC Research Project 2010 – 2012.
* Chivavava, J., Aspeling, B., Jooster, D., Peters, E., Ndoro, D., Heydenrych, H., Rodriguez-Pasual, M and Lewis A.E. 2018. **Continuous Eutectic Freeze Crystallization 2229/1/18,** WRC Research Project 2013 – 2017.
* Chivavava, J., Mehlo, B., Harding, G., Heydenrych, H and Lewis, A.E. Brine systems and Processes, K/2576 - WRC Research Project 2016 – 2019.

# University Management And Administration

* College of Fellows Leadership Group (2020 - )
* Teaching Online Task Team (2020 - )
* Selection committees for the University Vice Chancellor, Deputy Vice Chancellor (Teaching and Learning), Dean of Science, Dean of CHED, Executive Director: Research
* Vision 2030 Task Team [2019 -
* Senate Academic Planning and Development Committee (2018 -)
* Convenor of the University’s Futures Think Tank (2018 – )
* Consultative Forum for Academic Staff Matters, member (2018 - )
* Institutional Forum -Council working group on Private Security, member (2017 – 2020)
* Deans Representative on University Resources Allocation Advisory Group (2017 - )
* Deans Representative on Council Commission to Review Committees (2017 - )
* University Works of Art Committee (2017 - 2020)
* University Orator, (2010 – 2015)
* URC Committee on Research Reviews, (2011- )
* Senate Executive Committee, member (2004-present)
* Senate, member (2003- )

Faculty:

* Faculty Examinations Committee, member (2013 - )
* Dean’s Advisory Committee, member (2013 - )
* Promotion and Remuneration Committee, member (2013 - )
* Various Faculty Selection Committees for School of Architecture, Planning and Geomatics, Civil, Chemical, Electrical and Mechanical Engineering and Centre for Higher Education Development, member
* PGPAC-Postgraduate Planning & Administration Committee, member (2011- 2012)
* Task Group for the UCT Water Research Institute, convenor (2010-2012)
* EBE Faculty Board, member (1996 - )
* University Science Faculty Board as EBE Faculty Representative, member (2010-2011)
* EBE URC Block Grants Committee, member (2010)
* Working Group on Research for Academic Ad Hominem Promotions, convenor (2007‑ 2012)
* Faculty Human Resources Committee, member (2007- 2012)
* Committee of Assessors, Faculty of Engineering and the Built Environment, member (2006 - )
* Faculty Cost Recovery Task Group, convenor
* Faculty Working Group on Postgraduate Supervision, convenor
* Faculty Equipment Committee, departmental representative

Department:

* Head of Chemical Engineering Department (2013-2015)
* Departmental Representatives Committee, member (2013 - )
* SARChi Chair, Selection Committee, member (2011)
* Postgraduate Studies, director (July-December 2006, 2011-2012)
* Department of Chemical Engineering, deputy head of department (May 2010– March 2012)
* Departmental Seminar Programme, convenor (2006)