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Research

My field of research is stellar spectroscopy. My main project deals with the origin of the galactic bulge and the chemical description of the Galactic Center and its connection to the inner 3 degrees of the bulge. The methodology I am using to achieve this goal is the investigation of giant stars in the bulge at high spectral resolution in the near-IR. A red thread through my research projects have been spectroscopy at high resolution with special emphasis on the opportunities that come with cutting-edge IR spectrometers and the development of methodologies for this new research field. See also www.astro.lu.se/~ryde

Qualifications

engineering physics, MSc , Departments at LTH

Employment

Office director, Professor

Astrophysics
Lund University
Lund, Sweden
2022 Dec 23 → present

Researcher

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Research outputs

Chemical Abundances in the Nuclear Star Cluster of the Milky Way: Alpha-element Trends and Their Similarities with the Inner Bulge

Ryde, N., Nandakumar, G., Schultheis, M., Kordopatis, G., Matteo, P. D., Haywood, M., Schödel, R., Nogueras-Lara, F., Rich, R. M., Thorsbro, B., Mace, G. N., Agertz, O., Amarsi, A. M., Kocher, J., Molero, M., Orglia, L., Pagnini, G. & Spitoni, E., 2025 Feb 1, In: Astrophysical Journal. 979, 2, 174.

Metallicity-dependent kinematics and orbits in the Milky Way's nuclear stellar disc

Nogueras-Lara, F., Nieuwmunster, N., Schultheis, M., Sormani, M. C., Fragkoudi, F., Thorsbro, B., Rich, R. M., Ryde, N., Sanders, J. L. & Smith, L. C., 2024 Oct 1, In: Astronomy and Astrophysics. 690, A313.

M giants with IGRINS: IV. Identification and characterisation of a NIR line of the s-element barium

Nandakumar, G., Ryde, N., Hartman, H. & Mace, G., 2024 Oct, In: Astronomy and Astrophysics. 690, A226.

M giants with IGRINS: III. Abundance trends for 21 elements in the solar neighborhood from high-resolution near-infrared spectra

Nandakumar, G., Ryde, N., Forsberg, R., Montelius, M., Mace, G., Jönsson, H. & Thorsbro, B., 2024 Apr 1, In: Astronomy & Astrophysics. 684, 23 p., A15.

Composition of Giants 1° North of the Galactic Center: Detailed Abundance Trends for 21 Elements Observed with IGRINS

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A Wide Metallicity Range for Gyr-old Stars in the Nuclear Star Cluster

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M giants with IGRINS: II. Chemical evolution of fluorine at high metallicities

Nandakumar, G., Ryde, N. & Mace, G., 2023 Aug 1, In: Astronomy and Astrophysics. 676, 11 p., A79.

Detailed α abundance trends in the inner Galactic bulge

Nieuwmunster, N., Nandakumar, G., Spitoni, E., Ryde, N., Schultheis, M., Rich, R. M., Barklem, P. S., Agertz, O., Renaud, F. & Matteucci, F., 2023 Mar 1, In: Astronomy and Astrophysics. 671, A94.

First r -process enhanced star confirmed as a member of the Galactic bulge

Forsberg, R., Rich, R. M., Nieuwmunster, N., Jönsson, H., Schultheis, M., Ryde, N. & Thorsbro, B., 2023 Jan 1, In: Astronomy and Astrophysics. 669, A17.

M giants with IGRINS: I. Stellar parameters and α -abundance trends of the solar neighborhood population

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The Galactic chemical evolution of phosphorus observed with IGRINS

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Age and helium content of the open cluster NGC 6791 from multiple eclipsing binary members: III. Constraints from a subgiant

Brogaard, K., Grundahl, F., Sandquist, E. L., Slumstrup, D., Jensen, M. L., Thomsen, J. B., Jørgensen, J. H., Larsen, J. R., Bjørn, S. T., Sørensen, C. T. G., Bruntt, H., Arentoft, T., Frandsen, S., Jessen-Hansen, J., Orosz, J. A., Mathieu, R., Geller, A., Ryde, N., Stello, D. & Meibom, S. & 1 others, Platais, I., 2021 May 1, In: *Astronomy and Astrophysics*. 649, 8 p., A178.

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VINTERGATAN - II. The history of the Milky Way told by its mergers

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Vintergatan - i. The origins of chemically, kinematically, and structurally distinct discs in a simulated milky way-mass galaxy

Agertz, O., Renaud, F., Feltzing, S., Read, J. I., Ryde, N., Andersson, E. P., Rey, M. P., Bensby, T. & Feuillet, D. K., 2021, In: *Monthly Notices of the Royal Astronomical Society*. 503, 4, p. 5826-5845 20 p.

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Ryde, N., Jönsson, H., Mace, G., Cunha, K., Spitoni, E., Afşar, M., Jaffe, D., Forsberg, R., Kaplan, K. F., Kidder, B. T., Lee, J. J., Oh, H., Smith, V. V., Sneden, C., Sokal, K. R., Strickland, E. & Thorsbro, B., 2020 Apr 14, In: *Astrophysical Journal*. 893, 1, 37.

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Thorsbro, B., Ryde, N., Rich, R. M., Schultheis, M., Renaud, F., Spitoni, E., Fritz, T. K., Mastrobuono-Battisti, A., Origlia, L., Matteucci, F. & Schödel, R., 2020, In: *Astrophysical Journal*. 894, 1, 26.

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Abundances of disk and bulge giants from high-resolution optical spectra: IV. Zr, La, Ce, Eu

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The inner two degrees of the Milky Way: Evidence of a chemical difference between the Galactic Center and the surrounding inner bulge stellar populations

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The origin of stellar populations in the Galactic bulge from chemical abundances

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MOONS: the Multi-Object Optical and Near-infrared Spectrograph for the VLT

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The Gaia-ESO Survey: radial metallicity gradients and age-metallicity relation of stars in the Milky Way disk

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Harper, G. M., Carpenter, K. G., Ryde, N., Smith, N., Brown, J., Brown, A. & Hinkle, K. H., 2009, *AIP Conference Proceedings*. American Institute of Physics (AIP), Vol. 1094. p. 868-871

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Ryde, N., Edvardsson, B., Gustafsson, B. & Käufel, H.-U., 2007, *Proceedings of the International Astronomical Union*. Vazdekis, A. & Peletier, R. F. (eds.). Cambridge University Press, Vol. 241. p. 260-261

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Ryde, N., 2006, In: *Astronomy and Astrophysics Letters*. 455, p. L13-L16

Vintergatans bulb

Ryde, N., 2006, *Forskning och framsteg*, 2006, 8, p. 48-53.

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Ryde, F., Kocevski, D., Bagoly, Z., Ryde, N. & Mészáros, A., 2005, In: *Astronomy and Astrophysics*. 432, p. 105-116

On the Origin of Sulfur

Ryde, N. & Lambert, D. L., 2005, *ASP Conference Proceedings*. Bash, F. & Barnes III, T. (eds.). Astronomical Society of the Pacific (ASP), Vol. 336. p. 355

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Wallin, R., Eriksson, K., Gustafsson, B., Hinkle, K. L., Lambert, D. L., Ryde, N. & Westerlund, B., 2005, *ESO Astrophysics Symposia*. Käufel, H. U., Siebenmorgen, R. & Moorwood, A. (eds.). Springer, p. 439

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Korn, A. & Ryde, N., 2005, In: *Astronomy and Astrophysics*. 443, p. 1029-1032

The Abundance of Elements in Cool Stars, as Determined from High-Resolution, 1-5 Micron Spectroscopy

Ryde, N., Gustafsson, B., Eriksson, K. & Wahlin, R., 2005, *ESO Astrophysics Symposia*. Käufel, H. U., Siebenmorgen, R. & Moorwood, A. (eds.). Springer, p. 365-376

Non-thermal emission of Mg I at 12 micron m from Procyon

Ryde, N. & Richter, M. J., 2004, In: *Astrophysical Journal Letters*. 611, p. L41-L43

On the galactic chemical evolution of sulfur

Ryde, N. & Lambert, D. L., 2004, In: *Astronomy and Astrophysics*. 415, p. 559-569

TEXES Observations of Betelgeuse: Dynamics and Thermodynamics of the Wind Acceleration Zone

Harper, G. M., Brown, A., Richter, M. J., Holmes, S. & Ryde, N., 2004, In: *Bulletin of the American Astronomical Society*. 36, p. 1425

The R Coronae Borealis stars: carbon abundances from forbidden C-lines

Pandey, G., Lambert, D. L., Rao, N. K., Gustafsson, B., Ryde, N. & Yong, D., 2004, In: *Monthly Notices of the Royal Astronomical Society*. 353, p. 143-152

The Zeeman-sensitive emission lines of Mg I at 12 micron m in Procyon

Ryde, N., Korn, A., Richter, M. J. & Ryde, F., 2004, In: *Astrophysical Journal*. 617, p. 551-558

What does the Unexpected Detection of Water Vapor in Arcturus' Atmosphere Tell us?

Ryde, N., Lambert, D. L., Lacy, J. H., Richter, M. J. & Greathouse, T. K., 2003, *ASP Conference Proceedings*. Turcotte, S. T. S. C. K. A. R. M. C., Keller, S. C. & Cavallo, R. M. (eds.). Astronomical Society of the Pacific (ASP), Vol. 293. p. 214

Detection of Water Vapor in the Photosphere of Arcturus

Ryde, N., Lambert, D. L., Richter, M. J. & Lacy, J. H., 2002, In: *Astrophysical Journal*. 580, p. 447-458

Probing the mass-loss history of carbon stars using CO line emission

Schöier, F. L., Ryde, N. & Olofsson, H., 2002, In: *Astrophysical Journal*. 580, p. 447-458

The 3 micron m spectrum of R Doradus observed with the ISO-SWS

Ryde, N. & Eriksson, K., 2002, In: *Astronomy and Astrophysics*. 386, p. 874-883

Water in Arcturus' Atmosphere

Ryde, N., Lambert, D. L., Lacy, J. H. & Richter, M. J., 2002, In: *Bulletin of the American Astronomical Society*. 34, p. 779

Activities

Côte d'Azur Observatory

Ryde, N. (Visiting researcher)

2019 Jun 24 → 2019 Jul 20

The Galactic bulge in context of the MOSAIC spectrograph for the ELT

Ryde, N. (Invited speaker)
2019 Mar

'Abundance trends in the Bulge'

Ryde, N. (Speaker)
2019 Feb

'Abundance trends in the Bulge'

Ryde, N. (Speaker)
2019 Jan

'Detailed Abundances of Giants in the Inner Bulge and Galactic Centre'

Ryde, N. (Speaker)
2018 Dec

'The Milky Way's disks and bulge'

Ryde, N. (Keynote/plenary speaker)
2018 Nov

'Detailed Near-IR Stellar Abundances of Red Giants in the Galactic Cluster'

Ryde, N. (Speaker)
2018 Oct

Press release from Lund University

Ryde, N. (Role not specified)
2018 Oct → 2018 Dec

'Detailed near-IR stellar abundances of the Galactic Centre'

Ryde, N. (Role not specified)
2018 Jan

'Detailed Abundances of Giants in the Inner Bulge and Galactic Centre'

Ryde, N. (Keynote/plenary speaker)
2017 Jul

'Detailed near-IR stellar abundances of the Galactic Centre'

Ryde, N. (Speaker)
2017 Jan

'Infrared Stellar Spectroscopy and Analysis'

Ryde, N. (Invited speaker)
2015 Nov

'Detailed near-IR stellar abundances of the Galactic Centre'

Ryde, N. (Speaker)
2015 Jan

Vilka hemligheter ruvar Vintergatans centrum på?

Ryde, N. (Speaker)
2010 Mar 31

Prizes and Distinctions

Excellent Teacher Practitioner (ETP)

Ryde, N. (Recipient), 2012 Sept 21

Jury of Habilitation, Paris

Ryde, N. (Recipient), 2019 Mar

Ledamot Kungl. Fysiografiska Sällskapet

Ryde, N. (Recipient), 2021

Member of Sällskapet Lundaakademikerna

Ryde, N. (Recipient), 2010 Apr

Royal Swedish Academy of Sciences Research Fellow

Ryde, N. (Recipient), 2007 Sept 1

Awards**The Galactic Center as seen by MOONS**

Ryde, N. (PI)

Swedish Research Council: SEK3,900,000.00

2024/01/01 → 2028/12/31

Projects**4MOST: 4MOST - massive spectroscopic surveys of the Milky Way and the Universe**

Feltzing, S. (Researcher), Church, R. (Researcher), Hobbs, D. (Researcher), Bensby, T. (Researcher), Ryde, N. (Researcher), Hartman, H. (Researcher), Mcmillan, P. (Researcher), Jönsson, H. (Researcher), Agertz, O. (Researcher), Howes, L. (Researcher), Kushniruk, I. (Researcher), Agertz, O. (Researcher), Traven, G. (Researcher), Feuillet, D. (Researcher), Ernandes, H. (Researcher), Lehmann, C. (Researcher) & Plotnikova, A. (Researcher)

2011/01/01 → 2029/12/31

Carl-TryggerStiftelse: Water on Stars

Ryde, N. (PI) & Lambert, J. (Researcher)

2012/01/01 → 2013/12/31

Crafoordska stiftelsen: Post doc for Henrik Jönsson

Ryde, N. (Researcher)

eSSENCE@LU 11:3 - Systematic spectral clean-up for massively parallel surveys of stars

Church, R. (PI), Ryde, N. (Researcher), Korn, A. J. (Researcher), Lind, K. (Researcher) & Kordopatis, G. (Researcher)

2025/01/01 → 2026/12/31

Gaia-ESO Survey

Gilmore, G. (PI), Randich, S. (PI), Feltzing, S. (Col), Bensby, T. (Col), Howes, L. (Researcher), Gruyters, P. (Researcher), Ryde, N. (Col), Stonkute, E. (Researcher) & Ruchti, G. (Researcher)

2012/12/24 → 2022/07/01

Kungl. Fysiografiska Sällskapet: Infrared stellar spectroscopy

Ryde, N. (PI)

2012/01/01 → 2013/12/31

Kungl. Fysiografiska Sällskapet: Stjärnspektroskopiska undersökningar av Vintergatans bulb

Ryde, N. (PI)

2008/01/01 → 2009/12/31

KVA research fellow: Unveiling the Central Region of our Galaxy: How was it Formed and how did it Evolve?

Ryde, N. (PI)
2008/01/01 → 2012/12/31

PhD project: The cosmic origin of fluorine and sulphur: Infrared spectroscopic studies of red giants

Jönsson, H. (Research student), Ryde, N. (Supervisor) & Dravins, D. (Assistant supervisor)
2009/03/01 → 2015/06/05

PhD project: The origin and evolution of the Galactic Center

Thorsbro, B. (Research student), Ryde, N. (Supervisor), Jönsson, H. (Assistant supervisor) & Nilsson, H. (Assistant supervisor)
2016/07/01 → 2020/09/25

SOEB: Stiftelsen Olle Engkvist Byggmästare, Postdoc stipendium for Henrik Jönsson for two years

Ryde, N. (Researcher) & Jönsson, H. (Researcher)
2017/04/01 → 2019/04/01

The Galactic Center as seen by MOONS

Ryde, N. (PI) & Nandakumar, G. (Researcher)
Swedish Research Council
2024/01/01 → 2028/12/31

NMW: The New Milky Way

Feltzing, S. (PI), Bensby, T. (CoI), Lindegren, L. (CoI), Church, R. (Researcher), Hobbs, D. (Researcher), Ryde, N. (Researcher), Hartman, H. (Researcher), Mcmillan, P. (Researcher), Traven, G. (Researcher), Feuillet, D. (Researcher), Sahlholdt, C. (Researcher), Howes, L. (Researcher) & Stonkute, E. (Researcher)
Knut and Alice Wallenberg Foundation
2014/07/01 → 2027/06/30

VR-projektbidrag: Infraröd spektroskopi - ett nytt fönster mot galaktisk astronomi

Ryde, N. (PI)
2009/01/01 → 2013/12/31

VR-projektbidrag: Vintergatans ursprung - spektroskopiska undersökningar av stjärnpopulationer i Vintergatans centrum

Ryde, N. (PI)
2015/01/01 → 2017/12/31