Bio

Robert V. Wagoner's scientific direction was established rather suddenly in 1960, when he attended a series of lectures on cosmology by the British astrophysicist Fred Hoyle. At the time, Wagoner was a mechanical engineering undergraduate at Cornell University, receiving his B.M.E. in 1961. Born and raised in Teaneck, New Jersey, his other major interest was golf, leading to a position on the Cornell team. He switched to physics while at Stanford University, receiving an M.S. in engineering science in 1962 and a Ph.D. in physics in 1965. He then worked as a postdoctoral fellow at Caltech, collaborating with William A. Fowler and Hoyle on the first complete calculation of the abundances of the elements produced in the primordial universe. After three years, he returned to Cornell as a faculty member in the astronomy department. Five years later, he returned to Stanford's physics department, where he is a professor of physics, emeritus and a member of the Kavli Institute for Particle Astrophysics and Cosmology.

ACADEMIC APPOINTMENTS
- Emeritus Faculty, Acad Council, Physics

HONORS AND AWARDS
- Visiting Fellow, Institute of Theoretical Astronomy, Cambridge University (1967, 1971)
- George Ellery Hale Distinguished Visiting Professor, University of Chicago (1978)
- Sherman Fairchild Distinguished Scholar, Caltech (1976)
- Fellowship, Guggenheim Foundation (1978)
- Fellowship, A.P. Sloan Foundation (1969)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS
- Fellow, American Physical Society (1965 - present)
- Member, American Astronomical Society (1966 - present)

LINKS
- My Personal Website: https://web.stanford.edu/dept/physics/people/faculty/wagoner_robert-%20-%20Copy.html

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS
Probes (accretion disks, ...) of black holes, sources and detectors of gravitational radiation, theories of gravitation, anthropic cosmological principle.
Teaching

COURSES

2016-17
- Black Holes and Extreme Astrophysics: PHYSICS 17 (Spr)

2015-16
- Black Holes and Extreme Astrophysics: PHYSICS 17 (Spr)

Publications

PUBLICATIONS

- **Order out of Randomness: Self-Organization Processes in Astrophysics** SPACE SCIENCE REVIEWS
  2018; 214 (2)

- **Evidence for an Optical Low-frequency Quasi-periodic Oscillation in the Kepler Light Curve of an Active Galaxy** The Astrophysical Journal
  Wagoner, R. V., Smith, K. L., Mushotzky, R. F., Boyd, P. T.
  2018

- **DO MAGNETIC FIELDS DESTROY BLACK HOLE ACCRETION DISK g-MODES?** ASTROPHYSICAL JOURNAL
  2015; 809 (1)

- **DISKOSEISMOLOGY AND QPOs CONFRONT BLACK HOLE SPIN** ASTROPHYSICAL JOURNAL LETTERS
  Wagoner, R. V.
  2012; 752 (2)

- **A subhorizon framework for probing the relationship between the cosmological matter distribution and metric perturbations** MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY
  Amin, M. A., Wagoner, R. V., Blandford, R. D.
  2008; 390 (1): 131-142

- **Corotation resonance and diskoseismology modes of black hole accretion disks** ASTROPHYSICAL JOURNAL
  Silbergleit, A. S., Wagoner, R. V.
  2008; 680 (2): 1319-1325

- **Relativistic and Newtonian diskoseismology** Conference on Jean-Pierre Lasota, X-Ray Binaries, Accretion Disks and Compact Stars
  Wagoner, R. V.
  ELSEVIER SCI LTD.2008: 828–34

- **Normal modes of black hole accretion disks** GEOPHYSICAL AND ASTROPHYSICAL FLUID DYNAMICS
  Ortega-Rodriguez, M., Silbergleit, A. S., Wagoner, R. V.
  2008; 102 (1): 75-115

- **Diskoseismology** International Conference on Helioseismology, Asteroseismology and MHD Connections (HELAS II)
  Wagoner, R. V.
  IOP PUBLISHING LTD.2008

- **Global disk oscillation modes in cataclysmic variables and other newtonian accretors** ASTROPHYSICAL JOURNAL
  Ortega-Rodriguez, M., Wagoner, R. V.
  2007; 668 (2): 1158-1164

- **A timing signature of gravitational radiation from LMXB neutron stars** Conference on X-Ray Timing 2003 - Rossi and Beyond
  Wagoner, R. V.
  AMER INST PHYSICS.2004: 224–227
• Astronomy - Heartbeats of a neutron star  *NATURE*
  Wagoner, R. V.
  2003; 424 (6944): 27–28

• Conditions for steady gravitational radiation from accreting neutron stars *ASTROPHYSICAL JOURNAL*
  Wagoner, R. V.
  2002; 578 (1): L63-L66

• Relativistic diskoseismology. III. Low-frequency fundamental p-modes *ASTROPHYSICAL JOURNAL*
  Ortega-Rodriguez, M., Silbergleit, A. S., Wagoner, R. V.
  2002; 567 (2): 1043-1056

• "Stable" quasi-periodic oscillations and black hole properties from diskoseismology *ASTROPHYSICAL JOURNAL*
  Wagoner, R. V., Silbergleit, A. S., Ortega-Rodriguez, M.
  2001; 559 (1): L25-L28

• Relativistic diskoseismology. II. Analytical results for c-modes *ASTROPHYSICAL JOURNAL*
  Silbergleit, A. S., Wagoner, R. V., Ortega-Rodriguez, M.
  2001; 548 (1): 335-347

• Relativistic gravity and some astrophysical applications *Summer School on Astroparticle Physics and Cosmology*
  Wagoner, R. V.
  INT CENTRE THEORETICAL PHYSICS.2001: 1-?

• Gravitational radiation evolution of accreting neutron stars *20th Texas Symposium on Relativistic Astrophysics*
  Wagoner, R. V., Hennawi, J. F., Liu, J. S.
  AMER INST PHYSICS.2001: 781–786

• On the perturbations of viscous rotating Newtonian fluids (vol 537, pg 922, 2000) *ASTROPHYSICAL JOURNAL*
  Ortega-Rodriguez, M., Wagoner, R. V.
  2000; 543 (2): 1060

• On the perturbations of viscous rotating Newtonian fluids *ASTROPHYSICAL JOURNAL*
  Ortega-Rodriguez, M., Wagoner, R. V.
  2000; 537 (2): 922-926

• Direct analysis of spectra of the Type Ic supernova SN1994I *ASTROPHYSICAL JOURNAL*
  1999; 527 (2): 746-756

• An analytic approximation for plane-parallel compton scattering near accretion disks *ASTROPHYSICAL JOURNAL*
  Wagoner, R. V., Silbergleit, A. S.
  1999; 527 (1): 254-261

• Relativistic diskoseismology *Conference on Processes in Astrophysical Fluids on the Occasion of the 60th Birthday of Giora Shaviv*
  Wagoner, R. V.
  ELSEVIER SCIENCE BV.1999: 259–69

• Scalar-tensor cosmologies and their late time evolution *PHYSICAL REVIEW D*
  Santiago, D. I., Kalligas, D., Wagoner, R. V.
  1998; 58 (12)

• Nucleosynthesis constraints on scalar-tensor theories of gravity *PHYSICAL REVIEW D*
  Santiago, D. I., Kalligas, D., Wagoner, R. V.
  1997; 56 (12): 7627-7637

• The 67 Hz feature in the black hole candidate GRS 1915+105 as a possible "diskoseismic" mode *ASTROPHYSICAL JOURNAL*
  Nowak, M. A., Wagoner, R. V., Begelman, M. C., Lehr, D. E.
  1997; 477 (2): L91-L94
- Relativistic diskoseismology. Analytical results for "gravity modes" *Astrophysical Journal*
  Perez, C. A., Silbergleit, A. S., Wagoner, R. V., Lehr, D. E.
  1997; 476 (2): 589-604

- Relativistic diskoseismology *IAU Colloquium 163 on Accretion Phenomena and Related Outflows*
  Wagoner, R. V.

- Semianalytic continuum spectra of type-II supernovae *Astrophysical Journal*
  Montes, M. J., Wagoner, R. V.
  1995; 445 (2): 828-839

- Accretion disc turbulence and the X-ray power spectra of black-hole high states *Monthly Notices of the Royal Astronomical Society*
  Nowak, M. A., Wagoner, R. V.
  1995; 274 (1): 37-47

  1994; 421 (1): L27-L30

- Turbulent Generation of trapped oscillations in black-hole accretion disks *Astrophysical Journal*
  Nowak, M. A., Wagoner, R. V.
  1993; 418 (1): 187-201

- Green-function for metric perturbations due to cosmological density-fluctuations *Physical Review D*
  Jacobs, M. W., Linder, E. V., Wagoner, R. V.
  1993; 48 (10): 4623-4629

- SN-1992A - ultraviolet and optical studies based on HST, IUE, and CTIO observations *Astrophysical Journal*
  1993; 415 (2): 589-615

- Diskoseismology - signature of AGN and stellar mass black-hole accretion disks *Annals of the New York Academy of Sciences*
  Wagoner, R., Nowak, M.
  1993; 688: 721-725

- Milestones and missed opportunities in the early history of primordial nucleosynthesis *Annals of the New York Academy of Sciences*
  Wagoner, R.
  1993; 688: 731–38

- Cosmological Distances from supernova photospheres *Physics Reports-Review Section of Physics Letters*
  Wagoner, R. V., Montes, M.
  1993; 227 (1-5): 205-221

- Milestones and missed opportunities in the early history of primordial nucleosynthesis *16th Texas Symp on Relativistic Astrophysics / 3rd International Symp on Particles, Strings, and Cosmology*
  Wagoner, R.
  New York Acad Sciences. 1993: 731–38

- Diskoseismology - signature of AGN and stellar mass black-hole accretion disks
  Wagoner, R., Nowak, M., Akerlof, C. W., Srednicki, M. A.

- Diskoseismology - probing accretion disks near black holes and neutron stars *International Conference on Fluid Mechanics and Theoretical Physics, in Honor of Professor Pei-Yuan Chous 90th Anniversary*
  Wagoner, R. V.
DISKOSEISMOLOGY - PROBING ACCRETION DISKS .2. G-MODES, GRAVITATIONAL-RADIATION REACTION, AND VISCOSITY  
ASTROPHYSICAL JOURNAL  
Nowak, M. A., Wagoner, R. V.  
1992; 393 (2): 697-707

OBTAINING THE METRIC OF OUR UNIVERSE  
PHYSICAL REVIEW D  
JACOBS, M. W., LINDER, E. V., WAGONER, R. V.  
1992; 45 (10): R3292–R3295

DISKOSEISMOLOGY - SIGNATURES OF BLACK-HOLE ACCRETION DISKS  
2ND ANNUAL MID-OCTOBER TOPICAL ASTROPHYSICS CONF : TESTING AGN ( ACTIVE GALACTIC NUCLEI ) PARADIGM  
Nowak, M., Wagoner, R. V.  
AIP PRESS.1992: 231–234

DISKOSEISMOLOGY - PROBING ACCRETION DISKS .1. TRAPPED ADIABATIC OSCILLATIONS  
ASTROPHYSICAL JOURNAL  
Nowak, M. A., Wagoner, R. V.  
1991; 378 (2): 656-664

CONTINUUM OPACITY PRODUCED BY SPECTRAL-LINES IN SUPERNOVAE AND SIMILAR EXPANSIONS  
ASTROPHYSICAL JOURNAL  
Wagoner, R. V., Perez, C. A., Vasu, M.  
1991; 377 (2): 639-646

TRAPPED OSCILLATIONS OF ACCRETION DISKS  
6TH ASTROPHYSICS MEETING OF THE INST ASTROPHYSICS PARIS / 129TH COLLOQUIUM OF THE INTERNATIONAL ASTRONOMICAL UNION : STRUCTURE AND EMISSION PROPERTIES OF ACCRETION DISKS  
Nowak, M., Wagoner, R. V.  
EDITIONS FRONTIERES.1991: 493–494

FROM THE EXPANSION OF SUPERNOVAE TO THE EXPANSION OF THE UNIVERSE  
WAGONER, R. V., NANOPOULOS, D. V.  
WORLD SCIENTIFIC PUBL CO PTE LTD.1991: 251–65

FROM THE EXPANSION OF SN-1987A TO THE EXPANSION OF THE UNIVERSE  
WAGONER, R. V., WOOSLEY, S. E.  
SPRINGER-VERLAG.1991: 741–50

DETERMINING THE PROPERTIES OF ACCRETION-GAP NEUTRON-STARS  
ASTROPHYSICAL JOURNAL  
Kluzniak, W., Michelson, P., Wagoner, R. V.  
1990; 358 (2): 538-544

PULSAR EVOLUTION  
NATURE  
Kluzniak, W., Lindblom, L., Michelson, P., Wagoner, R. V.  
1989; 339 (6219): 19-20

GRAVITATIONAL LENSING STATISTICS OF AMPLIFIED SUPERNOVAE  
ASTROPHYSICAL JOURNAL  
Linder, E. V., Schneider, P., Wagoner, R. V.  
1988; 324 (2): 786-793

SPECTRAL FLUX FROM LOW-DENSITY PHOTOSPHERES - LOW-TEMPERATURE RESULTS  
ASTROPHYSICAL JOURNAL  
HERSHKOWITZ, S., Wagoner, R. V.  
1987; 322 (2): 967-975

AMPLIFICATION AND POLARIZATION OF SUPERNOVAE BY GRAVITATIONAL LENSING  
ASTROPHYSICAL JOURNAL  
Schneider, P., Wagoner, R. V.  
1987; 314 (1): 154-175

SPECTRAL FLUX FROM LOW-DENSITY PHOTOSPHERES - APPROXIMATE RESULTS  
ASTROPHYSICAL JOURNAL  
HERSHKOWITZ, S., Linder, E., Wagoner, R. V.  
1986; 303 (2): 800-809
• SPECTRAL FLUX FROM LOW-DENSITY PHOTOSPHERES - NUMERICAL RESULTS. *Astrophysical Journal.*
  Hereshkowitz, S., Linder, E., Wagoner, R. V.
  1986; 301 (1): 220-229

• EVOLUTION OF THE INNERMOST STABLE ORBITS AROUND ACCRETING NEUTRON STARS. *Astrophysical Journal.*
  Kluzniak, W., Wagoner, R. V.
  1985; 297 (2): 548-554

• PREDICTED CONTINUUM SPECTRA OF TYPE-II SUPERNOVAE - LTE RESULTS. *Astrophysical Journal.*
  Shaviv, G., Wehrse, R., Wagoner, R. V.
  1985; 289 (1): 198-202

• GRAVITATIONAL-RADIATION FROM ACCRETING NEUTRON STARS. *Astrophysical Journal.*
  Wagoner, R. V.
  1984; 278 (1): 345-348

• ELECTRICALLY NEUTRAL QUARKS - PRODUCTION OF FRACTIONALLY CHARGED HADRONS. *Physical Review D.*
  Wagoner, R. V., Schmitt, I., Zerwas, P. M.
  1983; 27 (8): 1696-1704

• Cosmic horizons: understanding the universe. *The Portable Stanford.*
  Wagoner, R. V., Goldsmith, D. W.
  W.H. Freeman, 1983

• EFFECTS OF SCATTERING ON CONTINUUM RADIATION FROM SUPER-NOVAE AND DETERMINATION OF THEIR DISTANCES. *Astrophysical Journal.*
  Wagoner, R. V.
  1981; 250 (2): L65-L69

• ASTROPHYSICAL BOUNDS ON VERY-LOW-MASS AXIONS. *Physical Review D.*
  Dicus, D. A., Kolb, E. W., Teplitz, V. L., Wagoner, R. V.
  1980; 22 (4): 839-845

• GRAVITATIONAL-RADIATION FROM SLOWLY ROTATING COLLAPSE - AN EXACT GREEN-FUNCTION. *Astrophysical Journal.*
  Gaisser, B. D., Wagoner, R. V.
  1980; 240 (2): 648-657

• LOW-FREQUENCY GRAVITATIONAL RADIATION FROM COLLAPSING SYSTEMS. *Physical Review D.*
  Wagoner, R. V.
  1979; 19 (10): 2897-2901

• PRODUCTION OF FREE QUARKS IN THE EARLY UNIVERSE. *Physical Review D.*
  Wagoner, R. V., Steigman, G.
  1979; 20 (4): 825-829

• TUNABLE FREE-MASS GRAVITATIONAL-WAVE DETECTOR. *Physical Review D.*
  Wagoner, R. V., Will, C. M., Paik, H. J.
  1979; 19 (8): 2325-2329

• ASTROPHYSICAL BOUNDS ON MASSES OF AXIONS AND HIGGS PARTICLES. *Physical Review D.*
  Dicus, D. A., Kolb, E. W., Teplitz, V. L., Wagoner, R. V.
  1978; 18 (6): 1829-1834

• SLOWLY ROTATING, RELATIVISTIC STARS. *Astrophysical Journal.*
  Abramowicz, M. A., Wagoner, R. V.
  1978; 226 (3): 1063-1078

• LIMITS FROM PRIMORDIAL NUCLEOSYNTHESIS ON PROPERTIES OF MASSIVE NEUTRAL LEPTONS. *Physical Review D.*
  Dicus, D. A., Kolb, E. W., Teplitz, V. L., Wagoner, R. V.
  1978; 17 (6): 1529-1538

• CORRECTION\textit{Astrophysical Journal}\n  Wagoner, R. V.\n  1977; 215 (3): 984

• DETERMINING $Q_0$ FROM SUPERNOVAE\textit{Astrophysical Journal}\n  Wagoner, R. V.\n  1977; 214 (1): L5–L7

• ELEMENT PRODUCTION IN EARLY UNIVERSE\textit{Annual Review of Nuclear and Particle Science}\n  Schramm, D. N., Wagoner, R. V.\n  1977; 27: 37-74


• VARIATIONAL ANALYSIS OF ROTATING NEUTRON STARS\textit{Astrophysical Journal}\n  Abramowicz, M. A., Wagoner, R. V.\n  1976; 204 (3): 896-899

• NEW TEST OF GENERAL RELATIVITY\textit{General Relativity and Gravitation}\n  Wagoner, R. V.\n  1976; 7 (4): 333-337

• POST-NEWTONIAN GRAVITATIONAL RADIATION FROM ORBITING POINT MASSES\textit{Astrophysical Journal}\n  Wagoner, R. V., Will, C. M.\n  1976; 210 (3): 764-775

• TEST FOR EXISTENCE OF GRAVITATIONAL RADIATION\textit{Astrophysical Journal}\n  Wagoner, R. V.\n  1975; 196 (2): L63-L65

• POST-NEWTONIAN GENERATION OF GRAVITATIONAL-WAVES\textit{Astrophysical Journal}\n  Epstein, R., Wagoner, R. V.\n  1975; 197 (3): 717-723

• POST-NEWTONIAN NEUTRON STARS\textit{Astrophysical Journal}\n  Wagoner, R. V., Malone, R. C.\n  1974; 189 (2): L75-L78

• WHAT CAN DEUTERIUM TELL US\textit{Physics Today}\n  Schramm, D. N., Wagoner, R. V.\n  1974; 27 (12): 40-47


• ALIGNED ROTATING MAGNETOSPHERES .1. GENERAL ANALYSIS\textit{Astrophysical Journal}\n  Scharlemann, E. T., Wagoner, R. V.\n  1973; 182 (3): 951–60

• BIG-BANG NUCLEOSYNTHESIS REVISITED\textit{Astrophysical Journal}\n  Wagoner, R. V.\n  1973; 179 (2): 343–60
• CLUSTERING EFFECTS AMONG CLUSTERS OF GALAXIES AND QUASI-STEMAR SOURCES *ASTROPHYSICAL JOURNAL*
Bogart, R. S., Wagoner, R. V.
1973; 181 (3): 609–18

• GRAVITATIONAL-WAVE OBSERVATIONS AS A TOOL FOR TESTING RELATIVISTIC GRAVITY *PHYSICAL REVIEW LETTERS*
1973; 30 (18): 884-886

• ELECTROMAGNETIC FIELDS PRODUCED BY RELATIVISTIC ROTATING DISKS *ASTROPHYSICAL JOURNAL*
Scharlemann, E. T., Wagoner, R. V.
1972; 171 (1): 107-+

• STRUCTURE OF RELATIVISTIC DISKS *ASTROPHYSICAL JOURNAL*
Salpeter, E. E., Wagoner, R. V.
1971; 164 (3): 557-?

• RELATIVISTIC DISKS .1. UNIFORM ROTATION *ASTROPHYSICAL JOURNAL*
Bardeen, J. M., Wagoner, R. V.
1971; 167 (3): 359-+

• SCALAR-TENSOR THEORY AND GRAVITATIONAL WAVES *PHYSICAL REVIEW D*
Wagoner, R. V.
1970; 1 (12): 3209-+

• OBSERVATIONAL UPPER LIMITS TO ELECTROMAGNETIC ENERGY RADIATED BY NORMAL GALAXIES *NATURE*
Harwit, M. O., Houck, Wagoner, R. V.
1970; 228 (5270): 451-+

• SYNTHESIS OF ELEMENTS WITHIN OBJECTS EXPLODING FROM VERY HIGH TEMPERATURES *ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES*
Wagoner, R. V.
1969; 18 (162): 247-+

• ELECTROMAGNETIC RADIATION FROM RELATIVISTIC OSCILLATORS *ASTROPHYSICAL JOURNAL*
Wagoner, R. V.
1969; 158 (2P1): 739-+

• UNIFORMLY ROTATING DISKS IN GENERAL RELATIVITY *ASTROPHYSICAL JOURNAL*
Bardeen, J. M., Wagoner, R. V.
1969; 158 (2P2): L65-+

• IMPLICATIONS OF FAR-INFRARED BACKGROUND MEASUREMENTS *NATURE*
Wagoner, R. V.
1969; 224 (5218): 481-+

• PHYSICS OF MASSIVE OBJECTS *ANNUAL REVIEW OF ASTRONOMY AND ASTROPHYSICS*
Wagoner, R. V.
1969; 7: 553+

• EXPLOSIVE NUCLEOSYNTHESIS *ASTROPHYSICAL JOURNAL*
Wagoner, R. V.
1968; 151 (3P2): L103-+

• SOME EFFECTS OF AN INTERVENING GALAXY ON RADIATION FROM VERY DISTANT OBJECTS *ASTROPHYSICAL JOURNAL*
Wagoner, R. V.
1967; 149 (3P1): 465-+

• COSMOLOGICAL ELEMENT PRODUCTION - A RECORD OF FIREBALL PHASE OF UNIVERSE MAY BE CONTAINED IN ABUNDANCES OF SOME LIGHT NUCLEI *SCIENCE*
Wagoner, R. V.
1967; 155 (3768): 1369-&

- **ON SYNTHESIS OF ELEMENTS AT VERY HIGH TEMPERATURES** *ASTROPHYSICAL JOURNAL*
  WAGONER, R. V., FOWLER, W. A., HOYLE, F.
  1967; 148 (1P1): 3-&

- **RADIO SOURCES AND PECULIAR GALAXIES** *NATURE*
  WAGONER, R. V.
  1967; 214 (5090): 766-&

- **CRITIQUE OF CLARK EFFECT** *NATURE*
  WAGONER, R. V.
  1967; 215 (5104): 943-&

- **POSSIBLE MECHANISM FOR PRODUCING STRONG RADIO SOURCES** *PHYSICAL REVIEW LETTERS*
  WAGONER, R. V.
  1966; 16 (6): 249-&

- **ROTATION AND GRAVITATIONAL COLLAPSE** *PHYSICAL REVIEW*
  WAGONER, R. V.
  1965; 138 (6B): 1583-&