CURRICULUM VITAE

Kenneth Neal Prestwich
24 September 2023

Academic Employment History:

- 2021 (1 September) Professor Emeritus
- 2010 (1 July 2011 – 30 June 2014): Chair of the Department of Biology, College of the Holy Cross.
- 2010 (Sept 2010 -2021): College of the Holy Cross, Professor of Biology
- 1990-present: College of the Holy Cross, Associate Professor of Biology
- 1984-1989: College of the Holy Cross, Assistant Professor of Biology
- 1983-1984: Swarthmore College, Visiting Assistant Prof. of Biology
- 1982-1983: Univ. of Florida, Dept. Physiol., Am. Heart Assoc. Postdoc.

Education:

- Ph. D. **University of Florida**, 1982 (Zoology) Supervisory Committee Chair: J. F. Anderson *The physiological and biochemical constraints on activity in spiders*
- M.S. **University of Florida**, 1975 (Zoology) Supervisory Committee Chair: J. F. Anderson *The cost of web construction in the wolf spider* Sossipus janus *Brady*
- B.S. **Davidson College**, 1971 (Biology)
- **Univ. of Utah** (1970, 72) (Two summer semesters additional course work)

Awards and Grants:

- **College of the Holy Cross Physicians Association Distinguished Service Award** (2023) Recognition for career work teaching and mentoring premedical students and years of service on the College's Premedical Advising Committee
- **Arthur J. O'Leary Faculty Recognition Award** (2009) College of the Holy Cross. I used 100% of this money ($10K) to help with the purchase of a new Zeiss Scanning Electron Microscope (total cost ~$150K)
- **Distinguished Service Award from the American Arachnological Society**.
- **Indiana Academy of Sciences** (2007) given to recognize some help I gave them and used to fund in ecology and environmental studies at CHC.
- **Howard Hughes Medical Foundation** (1996): Major Institutional grant to the College, my portion dealt with creation of a departmental computer lab and a non-major lab-based course in exercise physiology. Total award for my contributions ~ $120K.
- **Holy Cross College Distinguished Teaching Award** (1992)
- **New England Consortium for Undergraduate Science Education** (1992) Support for development of a "discovery approach" sequence of introductory biology labs.
- **NSF**: (1991) "Enhancement of metabolism and gas exchange labs in physiology" (NSF-Instrumentation and Laboratory Improvement Program, ILI #91-52301) $12,825 plus equal match from the college
- **NSF:** (1991) "Neuroanatomy and Neurophysiology labs for a psychobiology program" with John Axelson. $39K plus equal match from the college.
- **Howard Hughes Foundation** (1991) -- I did a major portion of the work of this grant as it dealt with psychobiology at Holy Cross. My section (coworkers -- G. Hoffmann, J.

Axelson, and C. Weiss) of the grant resulted in $120K of funds for equipment and the library.

- **NSF** (1986) College Science Instrumentation Program (#CSI-8650599): "Microcomputer data acquisition, manipulation, and modeling in physiology laboratories." ($11,325 + equal match)
- **Batchelor (Ford) Summer Stipend and Equipment Grant**, (Competitive) Holy Cross College, 1985 & 1988
- **Hewlett-Mellon Grant** Support for class development, five grants in the 1990s).

Publications: (CHC Student's names in BLUE)

A. Zoology:

1. **K.N. Prestwich. 2007.** Measuring the efficiency of sound production. Physiol Biochem Zool. 80, 157-165.
2. **K. N. Prestwich. 2006**. Anaerobic Metabolism and Maximal Running in the Scorpion *Centruroides hentzi* (Banks) (Scorpiones, Buthidae). J. Arachnology 34,351-356.
3. **K. N. Prestwich and O'Sullivan, K. 2005.** Simultaneous measurement of metabolic and acoustic power and the efficiency of sound production in two mole cricket species (Orthoptera: Gryllotalpidae). J. Exp. Biol. 208, 1495-1512.
4. **Y. P. Hung and K. N. Prestwich. 2005.** Is significant acoustic energy found in audible and ultrasound harmonics of the carrier frequency in ensiferan calling songs? J. Orthoptera Res. 13, 63-71.
5. **K. N. Prestwich, K.M. Lenihan and D.M. Martin. 2000.** The Control of Carrier Frequency in Cricket Calls: A Refutation of the Subalar-Tegminal Resonance/Auditory Feedback Model. J. Exp. Biol. 203: 585-596
6. **K. N. Prestwich. 1994**. Energy and constraints to acoustic communication in insects and anurans. Am. Zool. 94(6): 625-643.
7. **Santana, M, W. G. Eberhard, G. Bassey, K. N. Prestwich, R. D. Briceno. 1990.** Low Predation Rates in the Field by the Tropical Spider *Tengella radiata* (Araneae: Tengellidae). Biotropica 22(3): 305-309.
8. **K. N. Prestwich, K. E. Brugger, and M. Topping. 1989.** Energy and communication in three species of hylid frogs: power input, power output and efficiency. J. Exp. Biol. 144: 53-80.
9. **K. N. Prestwich. 1988a.** The constraints on maximal activity in spiders, I. Evidence against the hydraulic insufficiency hypothesis. J. Comp. Physiol. B. 158: 437-447.
10. **K. N. Prestwich. 1988b.** The constraints on maximal activity in spiders, II. Limitations imposed by phosphagen depletion and anaerobic metabolism. J. Comp. Physiol. B. 158: 449-456.
11. **J. F. Anderson and K. N. Prestwich. 1985.** The physiology of exercise at and above maximal aerobic capacity in a theraphosid (tarantula) spider *Brachypelma smithii*. J. Comp. Physiol. 155: 529-539.
12. **K. N. Prestwich. 1983.** Anaerobic metabolism in spiders. Physiol. Zool. 56: 112-121.
13. **K. N. Prestwich. 1983.** The roles of aerobic and anaerobic metabolism in active spiders. Physiol. Zool. 56: 122-132.
14. **K. N. Prestwich and N. H. Ing. 1982.** The activities of enzymes associated with glycolysis and the Krebs cycle in spiders. Comp. Biochem. Physiol. 72B: 295-302.
15. **J. F. Anderson and K. N. Prestwich. 1982.** Respiratory gas exchange in spiders. Physiol. Zool. 51: 72-90.
16. **K. N. Prestwich and T. J. Walker. 1981.** Energetics of singing in crickets. Effects of temperature in three trilling species. J. Comp. Physiol. 143: 199-212.

17. **J. F. Anderson and K. N. Prestwich. 1980.** Scaling of subunit structures in the book lungs of spiders. J. Morph. 165:167-174.
18. **K. N. Prestwich. 1977.** The energetics of web-building in spiders. Comp. Biochem. Physiol. 57A: 321-326.
19. **J. F. Anderson and K. N. Prestwich. 1975**. The fluid pressure pumps of spiders. Z. Morph. Tiere 81: 257-277.

B. <u>Mammalian Physiology</u>

1. **P. Posner, K. N. Prestwich, and D. D. Buss. 1985**. Cardiac maturation in an hypoxic milieu: implications for arrhythmias in hypoxemic defects. Ped. Res. 19: 64-66.
2. **R. Baney, K. N. Prestwich and P. Posner. 1984.** Electrophysiologic effects of indomethacin on the rabbit sinus node. Res. Commun. Chem. Pathol. Pharmacol. 44:171-1748.
3. **P. Posner, R. Baney and K. N. Prestwich. 1984**. The electrophysiological actions of phenylepherine on the rabbit SA node. Res. Commun. Pathol. Pharmacol. 44:315-318.
4. **S. P. Baker, K. N. Prestwich, P. Posner, R. Carpentier. 1984**. The resistance of the cardiac muscarinic receptor to chronic ethanol ingestion in the rat. Subst. Alcohol Actions 5: 185-192
5. **K. N. Prestwich, D. D. Buss, and P. Posner. 1984.** A new method for raising neonatal rabbits in a hypoxic environment. J. Appl. Physiol. 56: 1913-1916

C. <u>Recent Abstracts and Meeting Presentations (last five years):</u>

1. Prestwich, K. N., 2022. Energetics of sound production in the common true katydid *Pterophylla camellifolia*: metabolism, acoustic power, and efficiency of sound production. Presentation at SICB+ winter 2022.
2. Prestwich, K. N., **S. A. Zacharias, K. A. Morsch, & D. V. Cumming.** 2022. The little cricket that can? *Eunemobius carolinus* ground crickets appear to produce sound as efficiently as its larger field cricket cousins. Presentation at SICB+ winter 2022.
3. **J. McAlister and KN Prestwich 2020.** A liberal arts approach to introductory biology: Introductory sequence that gives full time to modern organismal biology. Society for Integrative and Comparative Biology Annual Meeting. Austin TX. **P3-228** Monday, Jan. 6 -- *I was principal author of the abstract and poster and Justin assisted and then presented it at the meeting.*

D. <u>Book Reviews:</u>

1. K. N. Prestwich & A. M. Sheehy. 2015. ***Integrating Concepts in Biology*: A Model for More Effective Ways to Introduce Students to Biology.** CBE Life Sci Educ 2015 14:fe3; doi:10.1187/cbe.15-04-0102
2. S*pider Ecophysiology*, edited by W. Nentwig. In Am. Sci. 77(1): 84.

E. <u>Research Tools – Computer Programs for Bioacoustical Analysis</u>: Uses zero crossing analysis to determine cycle-to-cycle spectral and amplitude characteristics of sounds. http://college.holycross.edu/faculty/kprestwi/ZC

<u>Significant Teaching Publications (not blind refereed) but available on the www or from me</u>

- **K. N. Prestwich. 1999. Game Theory Website.** An extensive website devoted to teaching game theory as applied to the evolution of animal behavior. The site features extensively illustrated explanations (the equivalent of a 70-page text) that is extensively hyperlinked. The main features of the site are three Java-language computer

simulations dealing with different types of games. The site has been **peer-reviewed and reviewed in at least one journal,** *Resonance (http://www.ias.ac.in/resonance/)* (Aug. 1999, p. 91). There is also a manual largely produced by Prof. Kevin Mitchell of the Department of Mathematics and Computer Sciences, Hobart, and William Smith College.
URL:http://college.holycross.edu/faculty/kprestwi/behavior/ESS/ESS_index_frmset.html

- **K. N. Prestwich. 1997-2012. *Animal Physiology* (Biology 390**) Teaching website. A website that serves 500 pages of notes, labs, and exercises for teaching animal physiology. This site is extensively updated yearly. It is a complete course, on-line. URL: http://college.holycross.edu/faculty/kprestwi/physiology/index.html

F. K. N. Prestwich, P.J. Lemay, and Lynn Cook. 1992. *Introductory Biology Laboratory Manual* (Biology 131). Dated -- presently being eclipsed!

Selected Seminars and Public Lectures: (since 2005):

- March 2016: Energy, "honesty" and sexual selection. Biology Department seminar series.
- Jan. 2016: Scientific Discovery – Darwin and *The Voyage of the Beagle* (aka *Journals Remarks*). To the Montserrat Core Human Questions cluster.
- May 2012: "Longleaf pine restoration as a vehicle for teaching the public about fire ecology." CHC Environmental Studies Faculty Retreat, Tower Hill Botanic Garden, Boylston, MA.
- April 2011 (Earth Day): "Phoenix: The Fall and Rebirth of an Iconic American Forest." Department of Biology, College of the Holy Cross.
- Feb. 2009: "Darwin's Other Mechanism of Evolution: Sexual Selection." Public Lecture on the 200th Anniversary of Charles Darwin's birth and the 150th Anniversary of the publication of the theory of evolution by natural selection by Darwin and A.R. Wallace. Department of Biology, College of the Holy Cross.
- Sept. 2005: "Calling energetics and sexual selection in orthoptera." University of Toronto at Mississauga.

Professional Societies:

- American Arachnological Society
- Animal Behavior Society
- Orthopterist's Society
- Society for Integrative and Comparative Biology (SICB)

Classes Taught and Developed at Holy Cross (since 1983):

- Courses for majors and pre-health students
    - **Various Introductory Biology Lectures and labs (Biology 120, 121, 131, 132, 161 & 162 --** covering the hierarchy from CMB through ecosystems).
    - **Genetics** (Biology 261 as sabbatical replacement, twice)
    - **Ethology and Behavioral Ecology** (Biology 287) and **Sociobiology** (Biology 285-discontinued)
    - **Ecosystems Ecology** (Biology 331)
    - **Physiology (animal) + Lab** (Biology 390)
    - **Conservation Biology** (Biology 381, later revised to intermediate level Biology 281)
    - **Problems in Biology: Seminar in Electrophysiology** (three times as an overload)

- **Problems in Biology: Physiology of Movement and Biomechanics** (once)
- **Non-Majors Courses: Topics/Biological Principles** (Bio 114, 115, 117)
  - **Biological Principles: Conservation**
  - **Topics in Biology: Exercise Physiology**
  - **Biology and Behavior** (no longer taught)
  - **Topics in Biology: Genetics and Evolution** (no longer taught)
  - **College Honors Program Seminars: Sociobiology** (once)

Holy Cross Research & Honors Students: Average of two to three students per year (77 individuals since 1984) in projects usually lasting two semesters (range 1-3). Nearly all have gone on to medical school or to graduate work in physiology or animal behavior. They have attended institutions that include Oxford, Harvard, Chicago, and a number of prestigious state universities. **Three were awarded Watson Fellowships and two became Rhodes Scholars, evidence of the high quality of Holy Cross undergraduates.**

Most Significant Service Since 1992

1. College of the Holy Cross (most recent first)

- **Committee on Tenure and Promotion** (2007-2009, 2001-2003 & 1992-1994)
- **Curriculum Committee** (2006-2008)
- **Committee on Faculty Affairs** (2000-2001(Chair), 1994-1996)
- **Subcommittee on Faculty Compensation** (Chair, 2000-2001, 1995-1996)
- **Appeals Committee** (1995-1996)
- **Harassment Grievance Panel**
- **Biological Psychology Concentration**
- **Environmental Studies Program**
- **Athletic Council** (1985-87; 2012-13)

2. Service to the Biology Department

- **Biology Department Chair**, July 2010 – June 2014. Major accomplishments included:
  - Leading the most extensive curricular revision in over 30 years.
  - Hiring of three tenure-track assistant professors, guided department work leading to three promotions to associate professor with tenure and one promotion to professor.
  - Upgrading staff teaching positions (Laboratory Instructors) to better cover departmental teaching needs.
  - The creation of two administrator/teaching positions (Ph.D. level).
- **Biology Department Search Committees**: At least 11 times with six as chair
- **Biology Department Assessment Committee 2017-201**
- **Departmental Tenure and Promotion Committee** (**fall 2018**)
- **Chaired Departmental Promotion Committee**s as chair departmental representative.
- **Biology Department Website** which I largely created and ran from near the College's first use of the www until the early "20 teens."
- **Biology Department Curriculum Committee**
- **Ecology, Evolution and Organismal Biology Journal Club** -- organizer
- **Departmental Botanical Garden** created and maintained in the late 1980s with Pete Lemay

3. Professional Service

- **Member of an external review panel for the Department of Biology, Creighton**

University (Jan. 2012).

- **American Arachnological Society (AAS)**: I created the Society's website in 1999 maintained for 12 years. Led society to open access (after a one year embargo) to all articles in the *Journal of Arachnology* (the premier arachnological journal, published by the AAS) and personally put the entire run of *JoA* ('73-2010) on-line, led the Society into JSTOR and BioOne, created an electronic payment system for membership, subscriptions, books and meetings, organized annual meeting registration and was a member of the AAS Executive Board '04-1'10. .
- **Orthopterist's Society** – Member of the **Editorial Board of the *Journal of Orthoptera Research***
- **Ad hoc Reviewer:** *Journal of Experimental Biology*, *Physiological and Biochemical Zoology, Journal of Insect Physiology, Physiological Entomology , Journal of Arachnology, Journal of the Royal Society* **,** *Animal Behaviour, Behaviour, Behavioral Ecology and Sociobiology, Ethology, Invertebrate Biology, Naturwissenschaften, Science, Biology Letters (Royal Society of London), Journal of Orthoptera Research, Interface*, and few others
- **Grant Reviewer**: National Science Foundation (NSF), National Research Council of Canada (NRC), Israel Science Foundation, National Geographic, and a considerable number of small NGOs.
- **Teaching Related Service:**
    - **Doctoral examination committee** (2012): Susan Weiner, Department of Biology, Tufts University, Medford, MA. Thermal biology of wasps.
    - **Doctoral examination committee** (2005) University **of Toronto, Toronto, Ontario**. Fernando Montealegre-Z. Biophysics of sound production in katydids.
    - **Physiological Ecology Graduate Short Course, University of Puerto Rico at Rio Piedras**. (March 1996 – one week of 12)
    - **Letters of Recommendation** Over my career I averaged close to 80 unique letters a year for about 25 different students, mostly for professional studies in some field of medicine.

4. **Community Service:**
    - **East Quabbin Land Trust, 2021->present (Hardwick, MA) volunteer work with invasive management and trail creation/maintenance**
    - **University of Florida Natural Area Teaching Laboratory (NATL),** 1994->2020. This is a 60-acre tract on the west end of the University of Florida campus that is being converted into a restored long-leaf pine forest, demonstration of ecological succession, and wetland habitat. Honored as a "super volunteer" was a member of NATL advisory board.