

TEACHING & RESEARCH at Undergraduate Institutions

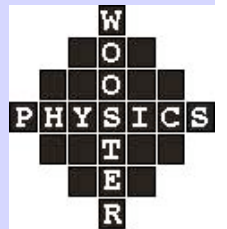


Shila Garg

Dean of the Faculty

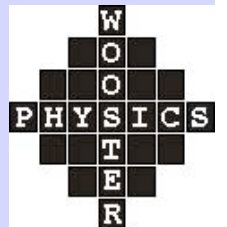
Professor of Physics

The College of Wooster, Wooster, OH



Where should you start?

- Learn more about the type of institutions - four year vs. two year, private vs. public, religious, liberal arts, community college, etc.
- Make sure your interest matches the type of school; understand the roles & responsibilities of faculty member at these institutions.
- What would an academic career at a four-year institution look like? What is your long-term research plan?
- Where does Physics fit in a small school?
- Learn more about the job search process.



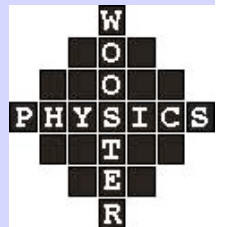
Understanding Small Campus Culture



Here is our President!



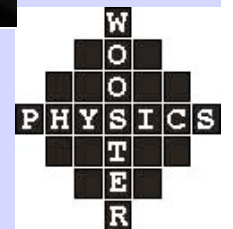
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Private Liberal Arts Institutions

-a glimpse

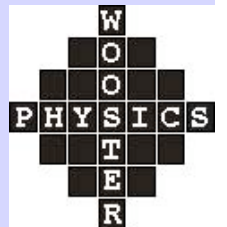
- ~90% full-time faculty
- Very few adjuncts
- 1800 students, 150 faculty
- Mostly residential
- Diverse student body with internationals & minorities
- Excellence in teaching, and research productivity expected
- Faculty involvement in campus activities
- Participation in community outreach



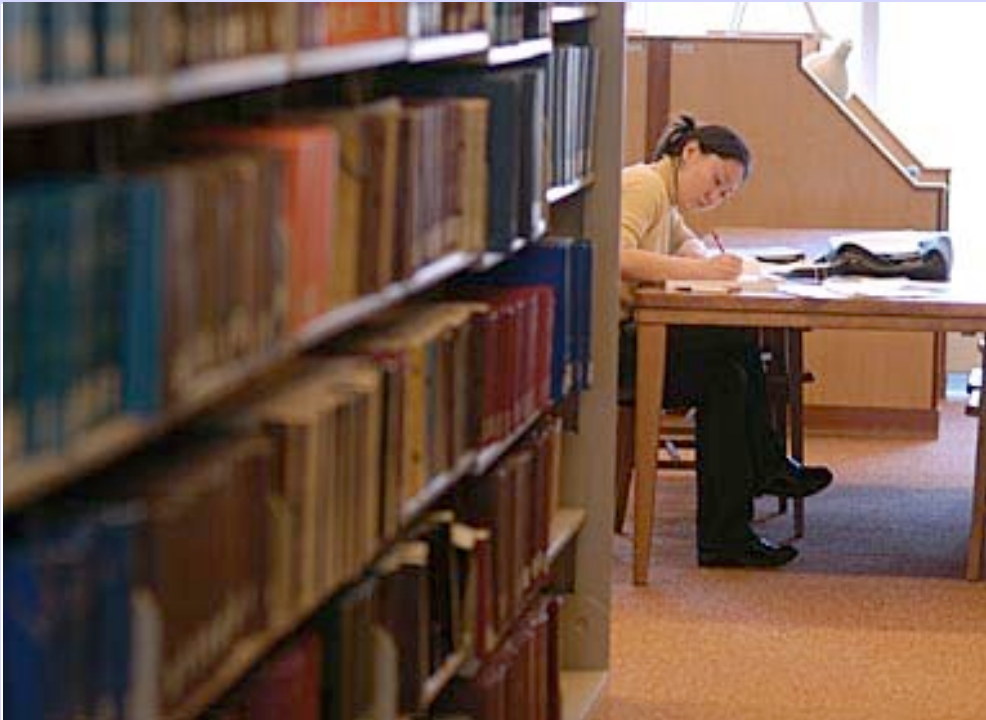
Campus Life

- Faculty community at the College, beyond the department
- Faculty Governance - committee work
- Opportunity to hear faculty research talks
- Discussion of Teaching Matters
- Science Round Table - for science faculty to share research
- Dissertation to Publication group
- Forum Series - Brian Greene, Jane Goodall, Azar Nafisi, Freeman Dyson, Michael Moore, David Brooks
- Great Decisions Series - World Political Issues
- Music, theatre performances, cultural activities, art museum, varsity and intramural sports

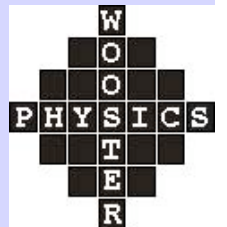
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LIBERAL ARTS

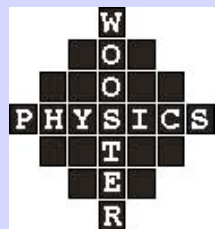
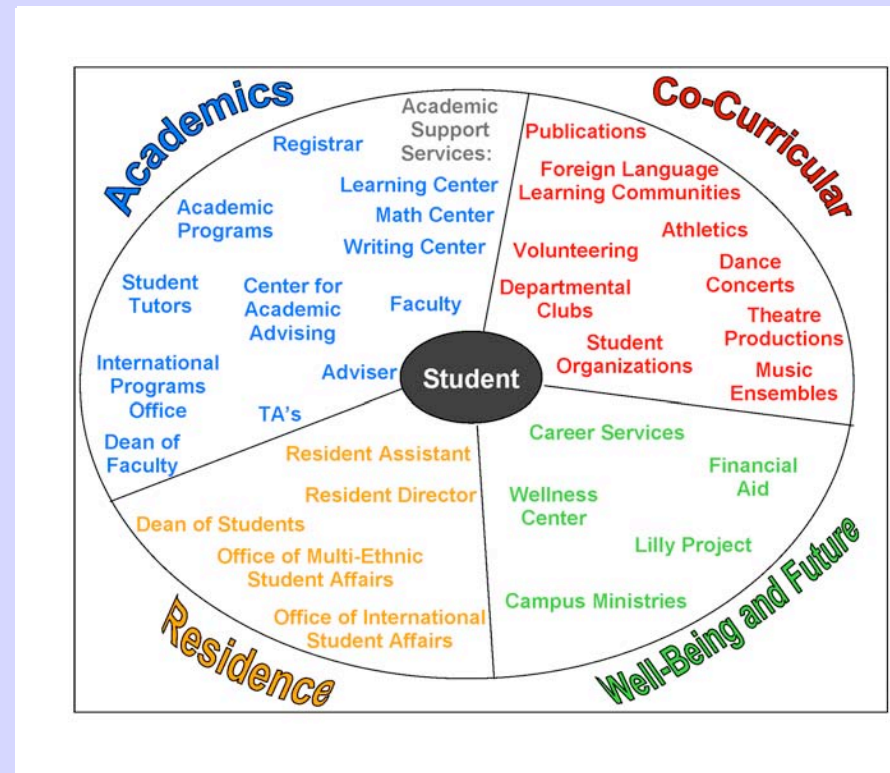


- educate rather than train
- foundations of critical thinking, intellectual skills, ethical judgment, and expanded cultural horizons
- education for life in a constantly changing world



ADVISING

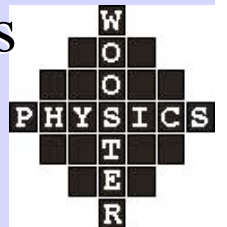
- Assisting students in the exploration of educational goals and choice of a major.
- Increasing student awareness of educational resources on campus
- Making learning appealing to the 'devised' students
- Graduate programs, Fellowships, career advise



UNDERGRADUATE RESEARCH

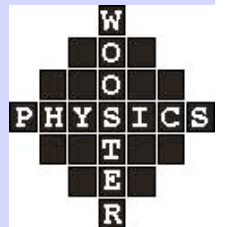


- Capstone Experience - Senior Independent Study
- Summer research - NSF supported REU & RUI, NASA, PRF, Research Corporation
- College funds to hire students during the summer and school year
- Support for conference presentations
- Student co-authored papers in peer-reviewed journals



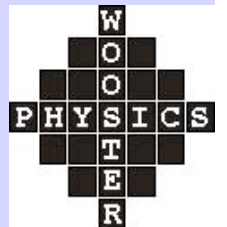
Positioning yourself to succeed in an academic job search

- What will make your application stand out?
- Why should your Cover Letter, C.V., and Teaching Statement be noticed in a pool of >200?
- How can you have a successful interview?
- What is a realistic research plan?
- How to negotiate for start-up funds and salary?



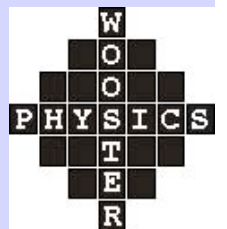
Cover Letter & C.V.

- Sell yourself!
- Show that you understand the type of institution.
- Talk about what you have to offer, why you are a good match for the school, what your career plans are, your interest in students & teaching.
- Range of courses you can teach with your strengths and accomplishments in teaching.



Cover Letter & C.V.

- Learn about the institution - do your homework! Find out about the department and its activities.
- Refer to anything you may know about the institution in your cover letter - perhaps a graduate you have met or a faculty member's work.
- Explain why you are interested in a job there.
- Talk about your aspirations and preferred career trajectory.
- Indicate possible courses you would like to develop & include your teaching related materials.
- List research projects that can involve undergraduates.



Interview

**Dual Identity - departmental & institutional

Find out as much as you can about everyone you will meet during the interview.

Department:

- Interest and background to teach a variety of courses & labs
- A realistic research plan & projects suitable for undergraduates
- Interest in mentoring students outside of the classroom

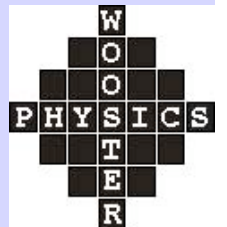
Institutional Identity:

Teaching Staff & Tenure or Hiring Faculty

Committee:

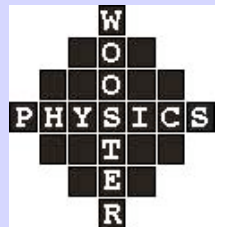
- Observes class and research presentations

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Interview

- Meets the candidate for lunch and talk about the review/tenure process
- Primarily the Committee will look for institutional match & collegiality
- Administration--looks for
 - Intellectual depth & vigor
 - Willingness to engage in the intellectual life of campus
 - A good match for the department's needs
 - Alignment of your career goals with what the institution can offer
 - Willingness to teach First-Year Seminar or interdisciplinary college-wide requirement

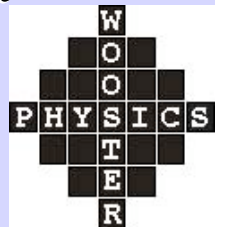


Questions



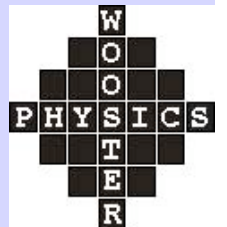
Ask Questions! It is not good if you have no questions about the place at all.

- Ask about teaching loads, what courses you are likely to teach in the first-year, and demographics of student body.
- Ask about support for teaching and research at the institutional level, software, IT support, tech support.
- **Ask what it takes to get tenure at the institution.**
- Ask about family-friendly policies.



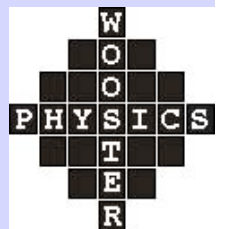
Job Talk

- Research Presentation
 - Know your audience! Ask the chair of the search committee at what level to aim the talk - are you talking to the faculty or students or to both?
 - Include examples of research questions/projects that are do-able at a small institution.
 - In preparing the presentation, motivate the project, present the big picture of where the field is going and why your work is important, give a lot of examples, context within which the future development of the project is important, etc.



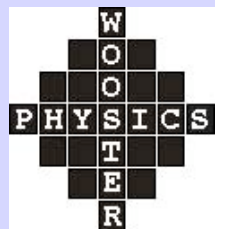
Teaching Presentation

- (real or mock)
 - Understand your assignment clearly! Is this an on-going class? How many students? Will the hiring faculty committee be present? What can you assume about where the class is? --get access to syllabus, textbook, so you know where your lecture fits in.
 - Find out if there is a computer/projection system in the room and communicate your need for technology clearly. If possible, check it out before the actual class meets.



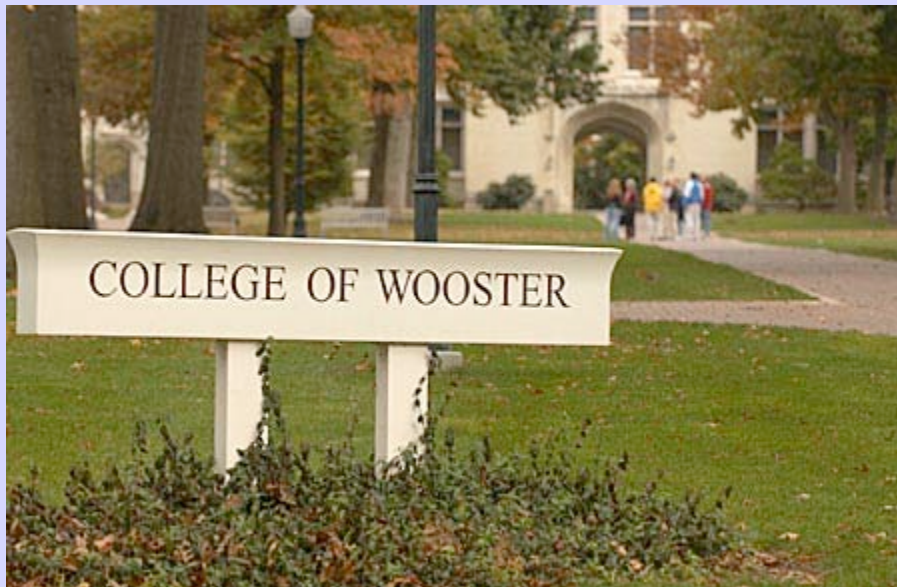
Teaching Presentation - continued

- If an introductory class, make use of simple demos (ask the chair about what the department has for the particular topic -- he/she will be happy to show you!) Show interest and not nervousness.
- Understand that it can be awkward since you do not know the names of students. But don't be afraid to call on them & ask them for names.
- Make sure you make eye-contact with the students; do not ignore puzzled looks, raised hands, or questions.



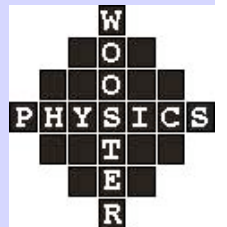
Teaching Presentation - continued

- Try to be as interactive as possible. Try not to just lecture for 50 minutes straight, even if it is brilliant!
- Aim it at the right level.
- Allow time to synthesize the lecture and to ask for questions or the ‘muddiest point.’



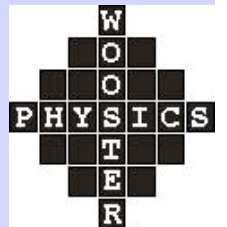
- Never go over time!

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When the offer is made

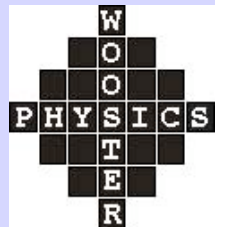
- How to negotiate?
 - Do your homework and find out any data on starting salaries in like institutions.
 - Ask about faculty development opportunities, conference attendance, course-release, grant-writing support, etc.
 - Talk to the dept. chair about what is reasonable to ask as start-up funds for equipment & computers.
 - Be realistic in what you ask for and balance with what you need to start a research program.



Early Career



- Participate in mentoring programs
- Balance the competing demands on your time
- Develop a publishable research program
- Write external grants
- Make use of faculty development opportunities



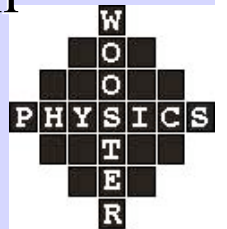
TEACHING PHILOSOPHY

“I can not teach anybody anything, I can only make them think” - Socrates



- Sage on the stage or guide on the side?
- Teaching or Learning centered?
- Articulate your teaching goals, your strengths, your style, your strategies for student learning
- How will you actively involve students in learning?
- Are you familiar with innovative pedagogies in Physics?

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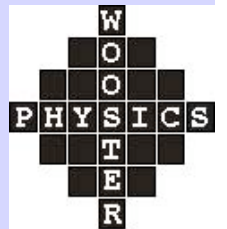


TEACHING PREPARATION

“A teacher affects eternity; he can never tell where his influence stops.” Henry Adams



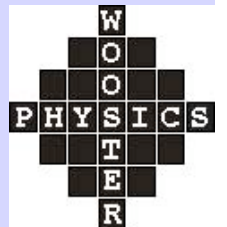
- Workshops for Teaching & Course-design
- Preparing Future Faculty
- Maintain a Teaching Portfolio
- Learn about innovative pedagogies :
 - Problem-based learning
 - Peer-instruction
 - Course-embedded research
 - Discovery-based learning



Planning Your Research

Being active researchers inspires us to be better teachers

- “I have been a teacher for so long that it has become the framework for my intellectual life. To teach well, I must stay abreast of developments in my field. To be an effective Independent Study adviser, I must also maintain and continuously enhance my research program” - Mark Wilson, Geologist



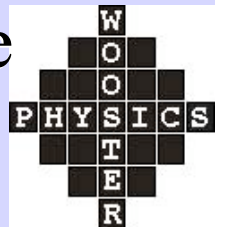
Planning Your Research



Scanning probe Microscope

- Can be cutting-edge and original
- Grant matching
- Support for grant-writing
- Start-up funds, continued support
- Course-release
- Research Leave

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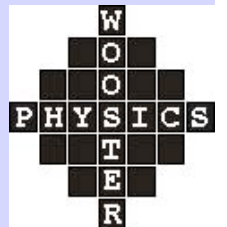


Planning Your Research



Liquid Crystal Research Lab

- Carve out time during summers and breaks to write papers & grant proposals.
- Look for collaborators at nearby universities.
- Attend professional conferences.
- Try to define projects that can be done with the least amount of learning curve for undergraduates.

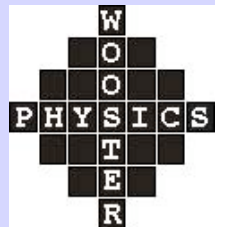


Some Successes at Wooster's Physics Department

My Colleagues:

- Don Jacobs is the recipient of the American Physical Society's 2000 prize for **Research in an Undergraduate Institution**
- John Lindner's research has appeared on the covers of [Nature](#) (30 November 1995), [Physics Today](#) (March 1996), [Science News](#) (13 April 1996), and on the annual [calendar](#) of the American Physical Society (1998)
- We have run an NSF REU site with 10 undergraduates for the past 12 summers.
- We have published over 21 student co-authored publications in peer-reviewed journals & 42 conference papers in the last 10 years.

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Good Luck!



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