

Abstract Submitted  
for the MAR10 Meeting of  
The American Physical Society

**How Rosalind Franklin Discovered the Helical Structure of DNA:  
Experiments in diffraction**<sup>1</sup> HEIDRUN SCHMITZER, DENNIS TIERNEY,  
GREGORY BRAUN, Xavier University — Rosalind Franklin, a chemical physi-  
cist (1920-1958), used X-Ray diffraction to determine the structure of DNA. In 1953  
she described the DNA has a helical structure with a period of 34 Å and a radius  
of 10 Å. We suggest experiments of varying equipment and difficulty which enable  
students to follow in the footsteps of Rosalind Franklin's discovery. To do this we  
increase the scale; instead of a tiny DNA molecule we examine the diffraction pat-  
tern of a helical spring from a ballpoint pen, and instead of X-Rays we use light  
rays. Students can then apply their experiences with diffraction on a helical spring  
to R. Franklin's X-Ray diffraction photo, which should be made available to them in  
original size. They can determine the angle, pitch, and radius of the DNA molecule,  
just like Rosalind Franklin. Our experiments can be used as demonstration exper-  
iments in interdisciplinary history and science lectures, or as lab experiments for  
undergraduate non science and science majors.

<sup>1</sup>This work was funded by the Women of Excellence Giving Circle at Xavier  
University.

Hans-Peter Wagner  
University of Cincinnati

Date submitted: 22 Nov 2009

Electronic form version 1.4