

Tuesday 12 Nov 2013

# ELEMENTAL X-RAY IMAGING

## WHAT CHARLES DARWIN DIDN'T KNOW

R. W. Morton  
*Phillips 66 Company*



Elemental X-ray imaging (EXI) of objects with irregular surfaces began in the late 1980s. The first EXI images measured in this format were of fossil fish and trilobites. These specimens showed elemental segregation representing hard and soft tissues. The discovery led to the understanding of the chemical fossil as an important concept used by paleontologists today. This presentation will cover the history and current research using EXI at the Stanford Linear Accelerator Center to reveal new details about Darwin's "dinobird" Archaeopteryx.

**6:00-6:30 pm Social Half Hour**

**6:30-7:30 pm Dinner**

**7:30-8:30 pm Presentation**  
**(room 101-102)**

### Buffet Menu

Chicken Pecan Alfredo pasta  
Beef Bolognaise Pasta  
Steamed Vegetable Medley  
Salad of Fresh Garden Greens  
w/ Confetti Garden Vegetables  
Ice Tea and Dessert

### Oklahoma State University

207 Wes Watkins Center, Stillwater, OK 74078  
(big globe at corner of Washington & Hall of Fame)  
map: <http://osu.okstate.edu/welcome/campusmap.pdf>

### Cost

\$15 members

\$5 students

### RSVP Deadline

Tuesday, Nov 5<sup>th</sup>, 5 pm

Contact: Toby Nelson

405-744-2482

[toby.nelson@okstate.edu](mailto:toby.nelson@okstate.edu)



OSU campus map  
QR code



OSU parking map  
QR code

*RSVP is NOT required to attend the presentation.*

## R.W. Morton Biographical Sketch

Dr. Morton has worked as an industrial chemist since 1977. He received his B.S. degree in Chemistry from Missouri Western State University (1979) and graduated with a Ph.D. in Analytical Chemistry–X-ray Spectrometry from the University of Missouri–Kansas City (1987). Dr. Morton began his career in the petroleum industry as an x-ray scientist for Phillips Petroleum Company which is today Phillips 66. He is a leading expert concerning sulfur in fuels and has numerous patents on the chemical removal of sulfur from fuel and gas streams. His instrument designs include the dual wavelength absorption edge spectrometer, the divergent beam diffractometer, and the dual wavelength ultra-low sulfur X-ray spectrometer.

Outside of the petroleum industry, Dr. Morton helped pioneer elemental x-ray imaging (EXI) of irregular 3-dimensional objects. His research led to the discovery of the "chemical fossil" that provided evidence that the chemistry of ancient life is directly related to that of modern animals. EXI was used to retrieve one of the lost works of Archimedes that was erased from recycled parchment many centuries ago. The X-ray images showed that Archimedes understood the concept of infinity and was performing calculus before 200 B.C. Recent EXI sessions at the Stanford Linear Accelerator Center revealed exciting details about the famous "dinobird" Archaeopteryx. Dr. Morton's research has been featured on the Discovery Channel and the National Geographic.

## **DRIVING DIRECTIONS TO THE WES WATKINS CENTER**

### **Directions from Tulsa via Cimarron Turnpike**

- Take Hwy 64 to the Cimarron Turnpike - toll gate (manned - \$.75)
- Take the OSU “Y” turnoff (approximately 20 miles) - toll gate (unmanned - \$.50)
- Continue on the turnpike. It will curve left into Stillwater and become Washington Street.
- Drive thru four traffic lights (Richmond Rd, The Links Apartments, & Airport and Lakeview Rds)
- Just before the next traffic light, go right at the "Y" (do not go through the light). This will keep you on Washington.
- Pass through two more traffic lights (Will Rogers Elementary School and McElroy Street).
- The Watkins Center is located on the left approximately three blocks after the 2nd light (McElroy).
- Turn left into the parking lot just before the Watkins Center (before the light at Hall of Fame and Washington).

### **Directions from Tulsa via State Highway 51**

- Travel through Stillwater to Duck Street.
- Turn right (north) onto Duck Street
- Go north to McElroy (4th traffic light).
- Turn left (west) onto McElroy.
- At the next light (Washington), turn left (south).
- The Watkins Center is located on the left, approximately three blocks south of McElroy.
- Turn left into the parking lot just before the Wes Watkins Center

### **Directions from Oklahoma City via I-35 North**

- Take the Stillwater Exit and turn right on State Highway 51 (you are approximately 17 miles west of Stillwater).
- As you enter the edge of Stillwater, turn left (north) at 4th traffic light, which is Western.
- As you round the curve, it becomes Hall of Fame.
- Turn left at 4th traffic light (Washington). The Wes Watkins Center is on the corner.
- Turn left onto Washington & right into the parking lot behind the building.