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Poster Presentation

**A New View of Carboniferous Arthropods Through Computed Tomography
Methods**

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The Mazon Creek fossil deposits here in Illinois and other similar deposits in Europe are little-known paleontological treasures. The fossil fauna and flora contains many diverse organisms exquisitely-preserved in siderite nodules from the Carboniferous Period (300-320 million years ago). The crustaceans in this fauna are of particular interest because they occur during a time period when the major modern groups of chelicerates were diverging from one another (the marine xiphosurans and the terrestrial arachnids). For my project, I am examining several specimens of ancient xiphosurans (relatives of horseshoe crabs). My objectives are to generate three dimensional reconstructions of the animals and to assess their evolutionary implications. Traditionally, we have been limited to examining such specimens wherever they have fortuitously broken out of the rock. This leaves many fine details about their morphology and three-dimensionality inaccessible. This is particularly true for xiphosurans, where their robust dorsal carapace hides details underneath.

Computed Tomographic scanning (CT scanning) offers us a new medium by which to examine fossils. With CT scanning, we can see subtle details that are undetectable if the fossil were to be examined using classical methods. This early phase of my project focuses on creating and refining a three dimensional model of the fossil organism. Eventually, the results of this research will show how these creatures functioned and help us reassess their evolutionary relationships and their place in arthropod evolution.