A Portable, Modular Roof for a Solar House
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Abstract
We designed and constructed a modular roof system for a 8’ x 12’ shed-sized, single room solar house. The house as well as the roof were built to be portable to make it easier for the entire structure to be moved to various locations for solar testing and data collection. Therefore the roof, consisting of small sections, can also be assembled and dissembled relatively easily.

Introduction
In the past decade, the effects of global warming have become increasingly prominent in everyday life. In order to curb these effects, major societal changes need to be made in how we perceive and use energy resources. Relatively simple alterations can be made in building construction that can minimize conventional energy use. For example, maximizing solar energy use can reduce some of our dependence on fossil fuels.

The construction of this solar house will provide a realistic means of testing the efficiencies of building materials. This includes using windows that maximize solar gain and sustainable insulation that minimizes heat loss. In addition, the roof is angled to maximize the energy from the sun and will eventually have a retractable awning to best utilize the sun’s energy.

Future Improvements
A 1.5’ retractable awning will be added onto the South side of the roof to allow sunlight into the house during the winter and prevent sunlight from hitting the windows in the summer.

Triangular Trusses are Assembled
Angle the roof at 43 degrees to maximize sunlight use
Awnings on North and South sides
Evenly spaced for maximum roof support
Support beam used to distribute roof weight more evenly

Roof Overhang
One 12’ roof section will extend over the front door of the house, acting as an awning over the front door.

Perforated Angle Iron
Keeps trusses standing upright
Prevents trusses from swaying

Gussets
Permanent
Used to secure wood beams

Bolts
Easily removed for disassembly

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