Presentation Outline

- USDA Consolidation Laboratories
- University of Wisconsin Interdisciplinary Research Center
- NASA Exploration Sciences Building
- Indianapolis Airport MidField Terminal
- Wrigley Global Innovation Center
- Indiana State University Atrium Project
- Kinard Middle School
- Prairie School Field House
- Kruse Elementary School
- Colorado School of Mines Recreation Center
USDA Consolidation Laboratories
Ames, Iowa

- Solar heat gain control for large atrium skylights
- Balance of daylight distribution in adjacent office and laboratory spaces
Interdisciplinary Research Center
Univ. of Wisconsin, Madison

- Low sun-angle shading from adjacent towers
- Larger fenestration areas, higher glazing transmittances, reduced overhangs considered in areas with greater shading
Shorter, "darker" window bands at less shaded facade.

Taller, "lighter" daylight window bands at more shaded facades.
Interdisciplinary Research Center
Univ. of Wisconsin, Madison

- Open Laboratory Space
- Daylight distribution comparisons
- Contrast ratios
Interdisciplinary Research Center
Univ. of Wisconsin, Madison

- Nighttime Laboratory lighting
- Task / Ambient electric lighting strategy
- Reduced daytime LPDs
- Zoned to balance luminous environment
• Enclosed / Open office space
• Created large internal lightshelf with perimeter ceilings
• Glazing area and transmittance adjusted for location
Interdisciplinary Research Center
Univ. of Wisconsin, Madison

- Overhead view of open office block
- Animated to illustrate direct sunlight interactions
- Animated False color illuminance map for annual representation of workplane illuminance
NASA Exploration Sciences Building
Greenbelt, Maryland

- Exterior model to study / illustrate solar shade effectiveness
- Vertical view offset to center perspective
NASA Exploration Sciences Building
Greenbelt, Maryland

- Daylight distribution
- Direct sunlight penetration
NASA Exploration Sciences Building
Greenbelt, Maryland

- Electric lighting integration
MidField Terminal
Indianapolis Airport, Indiana

- Exterior shading studies
- Over-arcing roof / buildings inside a building
MidField Terminal
Indianapolis Airport, Indiana

- Punched skylights to distribute daylight
- Afternoon solar gains mitigated with frits
MidField Terminal
Indianapolis Airport, Indiana

- Glare control studies for workers
- Lightwells provide daylight saturation onto 1st floor baggage claim
MidField Terminal
Indianapolis Airport, Indiana

- Civic Plaza
- Solar gain control
- Plant health
- Luminous balance with adjacent spaces
MidField Terminal
Indianapolis Airport, Indiana

- Electric Lighting Integration
- Task / Ambient approach
MidField Terminal
Indianapolis Airport, Indiana

- Glare control for concourses
- Dynamic solar animations
Wrigley Global Innovation Center
Chicago, Illinois

- Winter Garden
  Atrium break area
- Views from
  adjacent offices
Wrigley Global Innovation Center
Chicago, Illinois

- Illuminance-hour requirements for Ficus trees
- Identified shaded areas of inadequate daylight illuminance for supplemental electric lighting
Atrium Project
Indiana State University

- Optimized skylights relative to solar heat gain and light transmittance
- Illuminance-hour requirements for plantings
Atrium Project

Indiana State University

• Studied variety of solar control strategies
Kinard Middle School
Fort Collins, Colorado

- North classrooms glare north daylight balanced with Solatubes
- Dynamically scaled IES files used for annual daylight illuminance
Kinard Middle School
Fort Collins, Colorado

- Electric lighting designed to supplement daylight when inadequate
- Open loop continuous dimming control used
Kinard Middle School
Fort Collins, Colorado

- Southern classrooms utilize LightLouver Daylighting redirection system
- Solatubes balance daylight in rear of space
- Electric lighting used to balance luminous environment
Kinard Middle School
Fort Collins, Colorado

- Classroom wing corridors and locker areas
- Artistic solution explored for south glass facade
Kinard Middle School
Fort Collins, Colorado

- Solatubes used to balance glass daylight contribution
- Open floorplan allows daylight to saturate 1st floor areas
Prairie Field House
Racine, Wisconsin

- Optimized glazing locations and properties
- Used renderings for fund-raising activities for High School
Hired to fix glare issues on 8 prototype elementary schools
• Used calibrated Radiance model to compare glare control strategies

• Non-lambertian diffuse film had been used with extreme “hotspots”
Colorado School of Mines Rec Center
Golden, Colorado

- Solar penetration studies for all daylit spaces
- Glazing location optimized to reduce afternoon and summertime solar gains
- Morning, winter time gains control to help warmup and improve heating loads
Colorado School of Mines Rec Center
Golden, Colorado

- Veiling reflections, due to directional vertical daylight illuminance, overcome with overhead daylight contribution
- Walkaround panoramics used to help visualize luminance environment of various spaces