GRADUATION PROJECT
SOLAR ENERGY RESEARCH CENTER

KING SAUD UNIVERSITY
COLLEGE OF ARCHITECTURE AND PLANNING

SUPERVISORS:
PROF. ALI BAHAMMAM
ENG. ESSAM HAIDAR

STUDENT:
IBRAHIM ALBABTAIN
433102243

WHTAS PROJECT:

The world is looking for different ways to provide alternative energy that is not harmful to the environment due to the problems of climate and health that emerged in this age, as a result of the pollution on our planet as a result of the human output of research and intentional and unintended studies and environmental conclusions such as extracting energy from the sun and form through the solar cells for you People and governments began to move and search for how to extract and benefit from them and the flow of money and health for you began research centers appear in countries to examine and develop the way to extract and produce and benefit from them.

PROJECT GOALS:

Help create such a top
Local and global
Facilitate technology transfer
Conduct research and development activities
Create a wonderful educational environment
full of interest for center visitors

FUNCTION AND SECTIONS:

The basic function of the project:
- Management
- Research

Supporting functions:
- Cultural activities
- Service

USERS:

Staff:
- Administrative Section
- Research Department

Visitors:
- Men
- women
- Children
- Families

CRITICAL ISSUES:

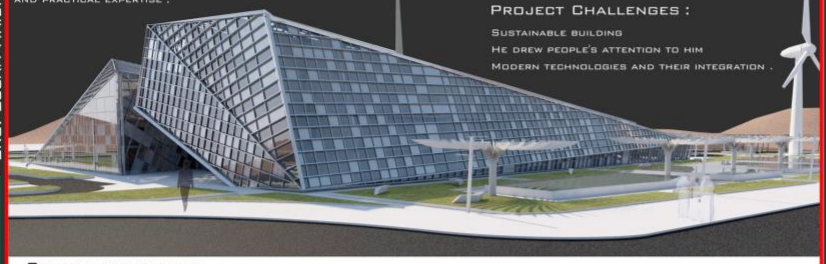
Search and make ideas
The center is focused on a group of experts and academics, preferably those who combine scientific and practical expertise.

PROJECT CONTEXT:

The project belongs to a research system, which necessitates the existence of the project from facilities that support research and technological development.

PROJECT CHALLENGES:

Sustainable building
He drew people's attention to him
Modern technologies and their integration.



SIMILAR EXAMPLES:

Chu Hall - Solar Energy Research Center

Architect
SmithGroupJJR

Location
Lawrence Berkeley National Laboratory, Berkeley, CA, USA

Area
m2 11887

year
2015

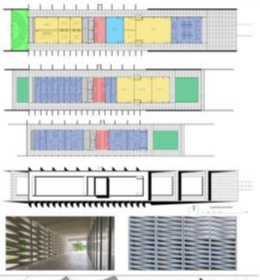
TecniA Biotechnology Institute

Architect
Augusto Quijano Arquitectos

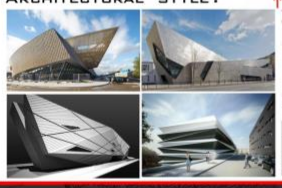
Location
Chablekal, Yuc., Mexico

Area
m2 5412.0

year
2014



ARCHITECTURAL STYLE:



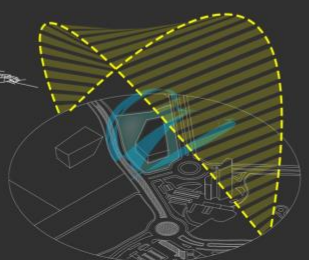
SITE ANALYSIS:

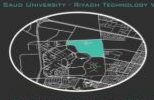
Location: Saudi Arabia - Riyadh
On the campus of King Saud University
Location of the land: The land is located within the Riyadh Valley Technology

Site Features:
- It is located on campus and close to the colleges, making it easier for researchers, students and interested people to access
- The quality of the Riyadh Technology Valley gave the site importance in its presence between research centers, which increases the possibility of communication from different disciplines and exchange of experiences
- His presence at one of the most important entrances at King Saud University

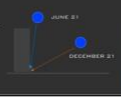
Site Images

Types of trees





Results:
Take advantage of the yards to distribute the light.
The use of horizontal solar precipitators.
Take into account the reflected light from the building to the ocean.



CONCEPT:

VALLEY:

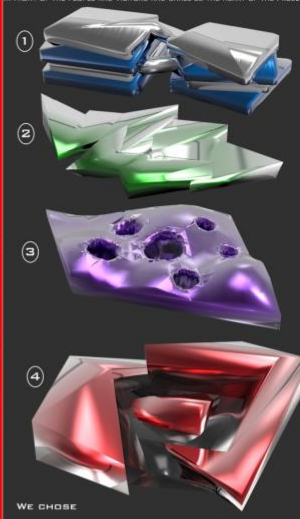
The project is located in Riyadh Technical Valley
University of King Saud University
Track the movement and wrap the blocks
Around the main corridors

TECHNOLOGY:

Technical methods and construction challenges
The basic proportion of technology and development of building materials or
Evolution of environmental treatments used

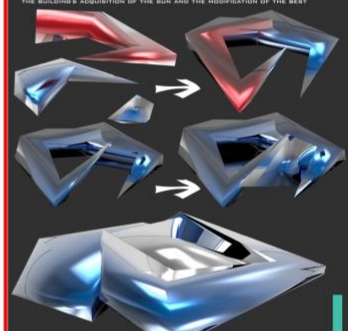
CONTAINMENT:

The results of the Center and the results of its research shall be contained in front of the people and visitors and shall be the heart of the project



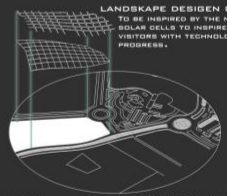
We chose
number 4:

Here we find the external disassembly, which wraps from all facades; so there is an environment we want to preserve. The deconstruction design represents the technology in construction and different levels help to reduce the building's acquisition of the sun and the modification of the best



LANDSKAPE DESIGEN CONCEPT:

To be inspired by the network of solar cells to inspire visitors with technology and progress.



LAMP DESIGEN CONCEPT:

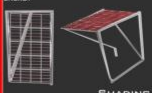
Outdoor lighting is designed to reflect two environments within and outside the project

OUTDOOR CHAIRS DESIGEN CONCEPT:

The outdoor seating chairs were inspired by the design of the center

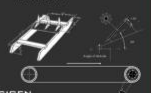
CARS SUNSHADE CONCEPT:

The umbrella design is consistent with the mass and is characterized by solar breakers to gain shade and gain energy



ELEVATION DESIGEN CONCEPT:

They will be solar panels moving to the sun to cast shadows inside and gain the maximum amount of radiation to convert it into energy



SHADING DESIGEN CONCEPT:

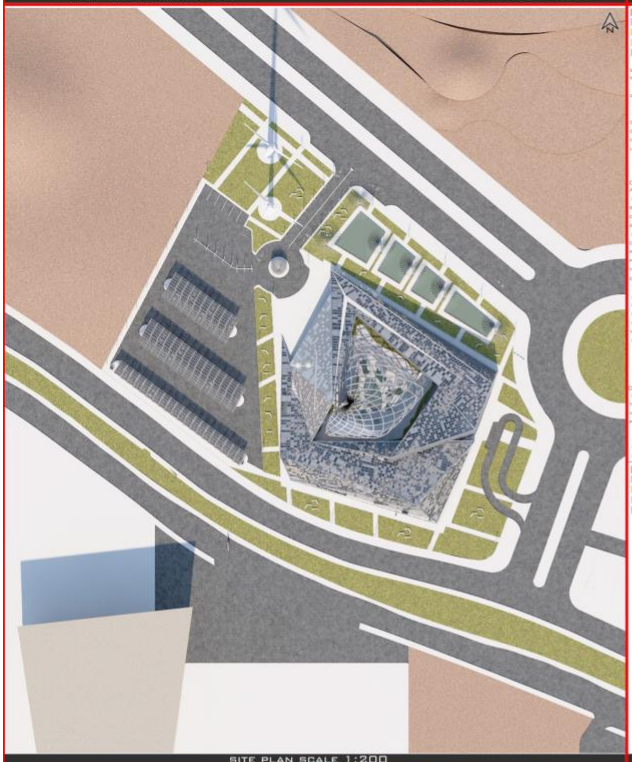
Since we support the use of alternative energy to preserve the environment, we liked to see visitors on the surrounding trees, and the output was transformed into the light of the aluminum halves in the shape of a tree

ELEVATION A SCALE 1:200

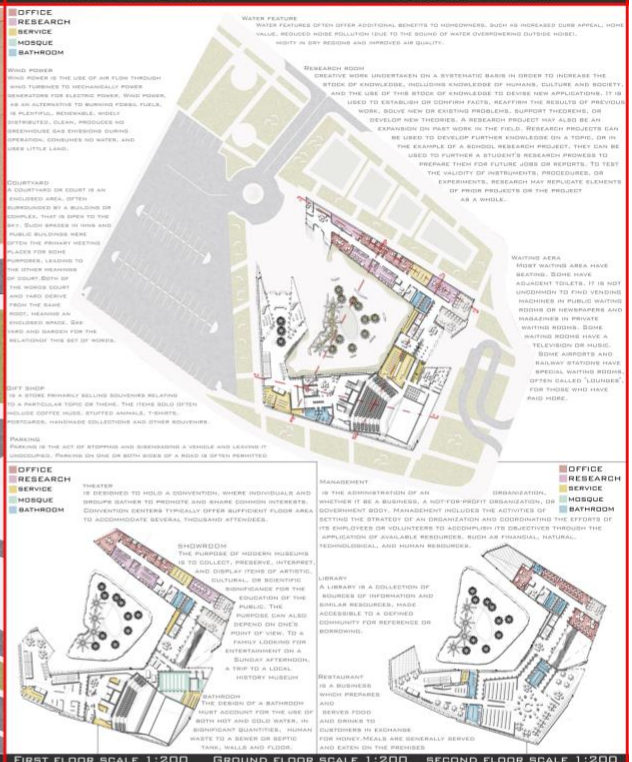
ELEVATION B SCALE 1:200

ELEVATION C SCALE 1:200

ELEVATION D SCALE 1:200



SITE PLAN SCALE 1:200

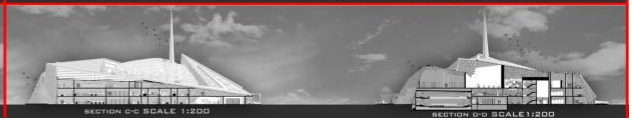


FIRST FLOOR SCALE 1:200 GROUND FLOOR SCALE 1:200 SECOND FLOOR SCALE 1:200

SAFETY SOLUTION SIMILAR EXAMPLES FOR SPACES

USERS SCENARIO ENVIRONMENTA CONTROL

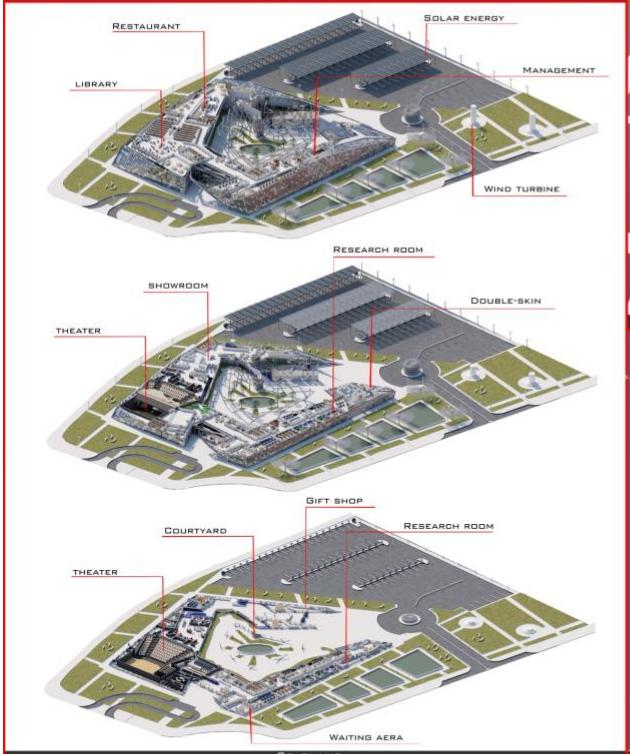
SECTION A-A SCALE 1:200 SECTION B-B SCALE 1:200



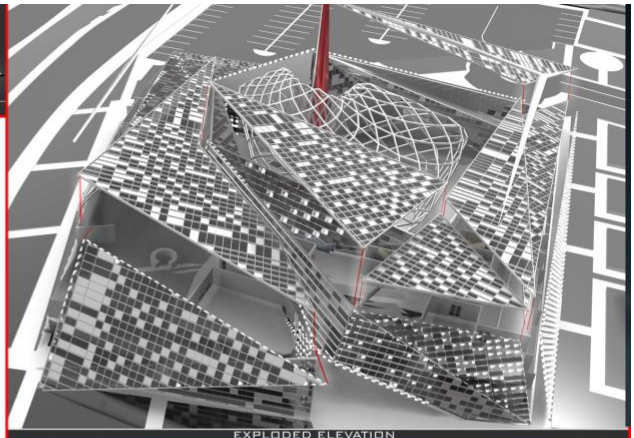
SECTION C-C SCALE 1:200 SECTION D-D SCALE1:200

SMART INTERFACES ARE USED AS SHEETS OF SOLAR CELLS THAT HAVE SENSORS TO MOVE ON AREAS WITH THE LARGEST SOLAR RADIATION

ELEVATION TECHNIQUE



3D PLANS



EXPLODED ELEVATION

THEATER DETAILS

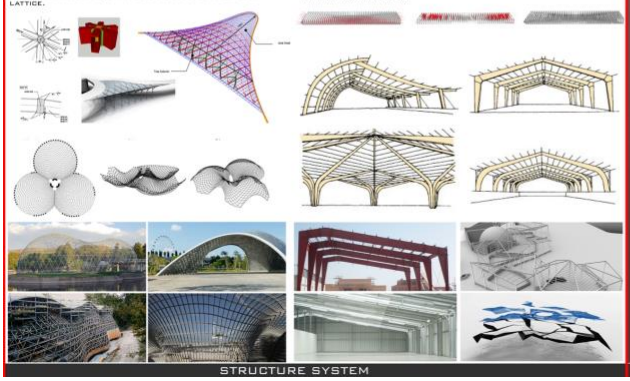
STRUCTURE

GRIDSHELL

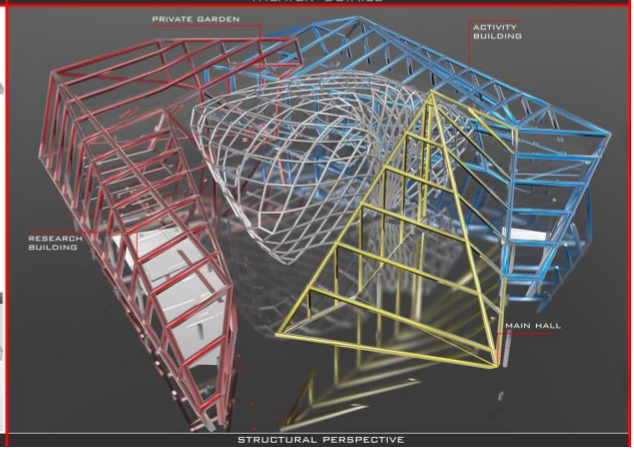
A GRIDSHELL IS A STRUCTURE WHICH DERIVES ITS STRENGTH FROM ITS DOUBLE CURVATURE (IN A SIMILAR WAY THAT A FABRIC STRUCTURE DERIVES STRENGTH FROM DOUBLE CURVATURE), BUT IS CONSTRUCTED OF A GRID OR LATTICE.

PORTAL FRAME

PORTAL FRAME CONSTRUCTION IS A METHOD OF BUILDING AND DESIGNING STRUCTURES, PRIMARILY USING STEEL OR STEEL-REINFORCED PRECAST CONCRETE ALTHOUGH THEY CAN ALSO BE CONSTRUCTED USING LAMINATED TIMBER SUCH AS GLULAM.



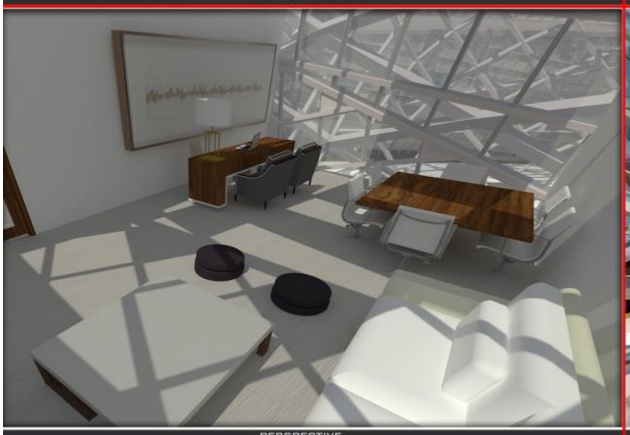
STRUCTURE SYSTEM



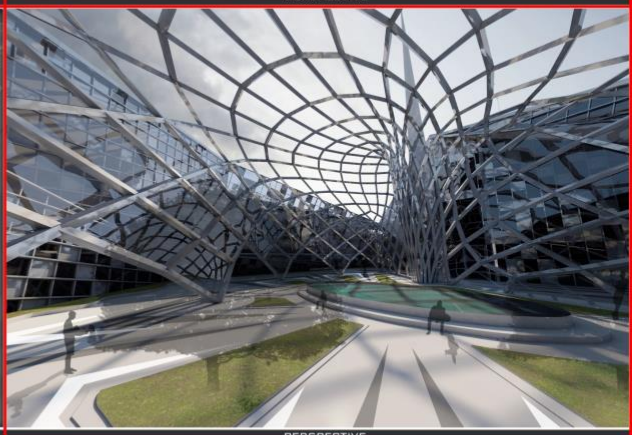
STRUCTURAL PERSPECTIVE

PERSPECTIVE

PERSPECTIVE



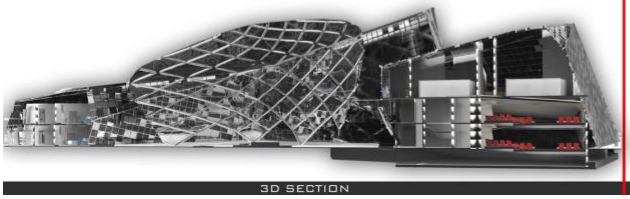
PERSPECTIVE



PERSPECTIVE

3D SECTION

3D SECTION



3D SECTION

3D SECTION