



*Swinburne Engineering*

**VICTORIAN MODEL SOLAR VEHICLE  
CHALLENGE**

***2011 Regulations for:  
Mars Rover***

**To be held at Scienceworks on  
October 23<sup>rd</sup>, 2011.**

*For further assistance, information and resources, please go to;*

*[www.modelsolar-vic.net](http://www.modelsolar-vic.net)*

*or contact the Secretary of the Challenge Organizing Committee*

*Email: [contact@modelsolar-vic.net](mailto:contact@modelsolar-vic.net)*

# OVERVIEW

*This is an open competition for model solar powered “Mars Rover” (MR) cars built by parents, teachers, students and any others who are interested. The track consists of a series of plywood sections with varying surfaces including a water splash. This is essentially an “obstacle course”. The track is divided down the centre so that 2 cars can travel over the track without interference.*

*The exact format of the competition will be determined once registrations are known and will be announced at the competition.*

## AIM

*The aim of the event is to:*

- 1. Encourage innovation, teamwork, enterprise and the research and application of science and engineering principles relating to solar energy, photovoltaics and efficient energy conversion, by designing, constructing, testing and racing a model solar vehicle conforming to the following specifications and capable of traversing the obstacles presented by the track.*
- 2. Provide a challenge to parents, teachers, university students and others who have mentored or observed model solar car races but have been ineligible to compete in the student event.*

## **A. INTRODUCTION**

### **A.1 Event name**

The event shall be known as the "Victorian Mars Rover Challenge" (VMRC). This, along with established car and boat races, will form a part of the Victorian Model Solar Vehicle Challenge (VMSVC).

### **A.2 Spirit of Intent**

The Challenge is designed so that teachers, mentors, former competitors and the general public have an independent challenge from that posed to school students registered in the VMSVC.

## **B. TRACK**

### **B.1 Size and Shape**

The track comprises sections of plywood with edge rails and centre divider 75-100mm high. (See photographs of track at 2006 event in Attachment A. The water splash was extended for 2007.)

The track will be laid out generally in a north / south orientation to minimize the effect of shading by the divider and edge rails.

The track consists of 5 segments with varying surfaces in succession,

- 1 Flat painted plywood
- 2 30-50mm diameter pebbles
- 3 Sand
- 4 Variably angled 25mm x 25mm "cattle grid"
- 5 Carpeted inclined ramp to the top of a 50mm plateau then declining into a 50mm deep pool with carpeted base (pool length approx. 600mm )  
Inclined ramp out of the pool to a 50mm plateau  
Declining ramp from the pool to the finish line, ie. ground

### **B.2 Starting Position**

Two cars will start in their separate lanes behind a start line on a horizontal section of the track.

### **B.3 Finish Position**

The car will be deemed to have finished when it exits the track onto the ground\*, or one minute has elapsed since the start. (\*The car must have completely left the track area)

## **C. DESIGN SPECIFICATION**

### **C.1. Solar panel**

The solar panel must be made from commercially available silicon solar cells.

### **C.2. On/off switch**

The car shall be fitted with a commercially available and operational on/off switch.

### **C. 3. Car size**

The entire car including solar panel, must be able to fit into a box 300mm long by 220mm wide and 200mm deep ( A4 paper box). The car must at no time when racing exceed these dimensions.

#### **C.4. Motors, drive, body construction, wheels and materials**

Any components can be used, except batteries. However, there must be an area 50 mm high and 200mm long on each side for the car name and number to be attached.

#### **C.5 Energy source, usage and storage**

No batteries are permitted on board the car.

The car shall operate only with the energy collected by its own solar panel during the race. Competitors will be required to demonstrate to the satisfaction of the scrutineers and starter that any systems capable of storing energy have no energy stored when the car is placed on the start line.

(For example capacitors are discharged, flywheels are not spinning, springs not compressed, pneumatic or hydraulic systems are at zero pressure, etc.)

### **D. SCRUTINEERING**

Each car will be scrutineered to ensure that it meets these regulations prior to racing.

### **E. COMPETITION**

#### **E.1 Structure of the races.**

The cars will be released after the starter counts down and timing commences. There will be a combination of round robin and knockout races. The exact format will be determined after registrations are received.

#### **E.2 Independent operation**

As Mars is a very remote location, the cars must be able to operate independently of any outside physical intervention. Remote control systems may be used provided the system on board the car is powered only by the solar panel see C5. Consequently once the race has started no handling of any cars during that race is allowed. Any handling of a car will indicate the car has been withdrawn from that race and the other car will be declared the winner.

#### **E.3 Winner**

The winner of the heat will be the car which goes the furthest in one minute or exits the track onto the ground in the shortest time.

### **F. REGISTRATION AND ENTRY**

Register your intent to participate by contacting:

The Secretary of the Organizing Committee

Email [contact@modelsolar-vic.net](mailto:contact@modelsolar-vic.net)

Mail The Victorian Model Solar Vehicle Challenge  
PO Box 108 Darling 3145

Before September 16<sup>th</sup>.

**ATTACHMENT "A" PHOTOGRAPHS OF TRACK AT 2006 EVENT**



