

NEWSLETTER # 2/2006

THE UNIVERSITY OF
NEW SOUTH WALES

Date: 20th July 2006
From: Prem L Kumar
Fax Number: 9385 7311
Telephone: 9385 7920
Number of Pages: 10



FACULTY OF SCIENCE

SunSprint 2006 News

Dear Colleague

Please find attached important information regarding the SunSprint 2006 Model Solar Car Challenge. This year we will be racing on a new track.

<p>Location: The University of New South Wales Quadrangle Lawn Entry via Barker Street (Gate 14) Kensington</p> <p>Dates: Friday 1st September and Saturday 2nd September 2006</p>
--

- Race Briefing
- Qualifiers
- Elimination & Finals
- Novice & Open – how it works
- **PIT AREA**
- Table area

- Postal Entries
- MAP

Important for both days

- Parking and Location
- Lunches

CONTENTS OF THIS NEWSLETTER:

Important things to know and do

- Parking Permits
- Student Lunches

DAY 1

Friday 1st September

Time Trials Day

- Schedule
- Parking and race location
- Security
- Caution!

DAY 2

Saturday 2nd September

Race Day

- Parking on Race Day
- Re-scrutineering
- Home-made modules
- Car Names
- Poster and Display Egg

IMPORTANT NOTES:

(1) Competition Format

In the event that the chief scrutineer believes that the event will not be completed before a light condition gives a competitor an unfair advantage (e.g., a building shadow across the track), the chief scrutineer maintains the right to implement a change of format of the competition and is only required to notify the affected competitors before implementing such a decision.

(2) Novice Competition Format

As SunSprint is run over two days we have the luxury of time to run novice finals. This means that the four teams that have advanced furthest through the knock-outs will compete against each other for 1st, 2nd, 3rd, and 4th Place Novice Category. This will be done just before the Open Class Finals.

REGULATIONS

Section 3.6 Poster

Don't forget, each team will be required to enter a poster as per this regulation. Posters and eggs will be judged on Friday and winners announced on Saturday.

Section 3.7 Interviews

There will be no interviews for SunSprint 2006. Those teams continuing to the Nationals are reminded that interviews will be conducted. This year's Nationals will be held at UNSW on 1st & 2nd December.

Section 3.8 Optional decorated egg

Certainly an option but it is a very nice addition to the competition. If you have time think about bringing a decorated egg to the competition do so and these will be judged on Friday and winners announced on Saturday.

LODGING

Addison's on Anzac which is just down the road from UNSW is good value for your money. Probably 15 minutes walking distance. Their Family Room sleeps 6.

Look at the following link:

<http://www.addisonsonanzac.com.au>

147 Anzac Parade
Kensington, NSW 2033
7 days 7:00am - 11:00pm
Tel: (1800) 336 336
Fax: (02) 9313 6216
Email: addisonsonanzac@ozemail.com.au
American Express, Bankcard, Cash, Cheque,
Diners Club, Mastercard, Travellers Cheques,
VISA

Additionally, a very easy (15-20min) bus trip straight up Anzac Parade is the **Y on the Park Hotel**. It is across from the War Memorial at Hyde Park. Very good rates for "Backpackers".

Look at the following link:

<http://www.ywca-sydney.com.au>

YWCA NSW

5-11 Wentworth Avenue
Sydney NSW 2000 Australia
Tel: (02) 9285 6211 Fax: (02) 9283 2485
Email: comprog@ywca-sydney.com.au

IMPORTANT: PARKING

Parking Permits, Parking and Location Parking Friday 1st September

It will be necessary for all **cars** parking on campus to park in the Barker Street Car Park via Gate 14 Barker Street (see *attached* map). Vehicles requiring greater than 2.2 metres clearance (e.g., 15 seat minivans) cannot fit in the parking station and will need special arrangements for parking on campus. **If you intend to have a minivan, please fax or email for special instruction: Prem Kumar Fax: 9385 7920, e-mail prem.kumar@unsw.edu.au**

Cars in the station may park in any non-reserved, non-"handicap only" parking area. Once parked, you must leave someone with your car while someone races off to scrutineering to pick up a parking permit if you already haven't received the voucher in the mail: this permit must be placed as directed in your car. Cars without parking permits will incur a **\$75.00** parking fine through the RTA so it is worthwhile to send in a request for the parking permit well in advance. That way you do not waste any time when you arrive on campus. We have allocated a maximum of four parking permits per school.

Parking Saturday 2nd September

Also University of New South Wales Open Day. Park as per Friday but there is no need for parking permits on Saturday 2nd September – parking is free on Saturdays. Note this weekend is also the university's Courses & Careers Day so you should arrive early to get a parking spot on campus.

RACE TRACK LOCATION

The Race Track is located in the UNSW Quadrangle Lawn. From the Barker Street parking station entrance, walk directly north for 150 metres. You will walk right onto the racetrack.

SUNSPRINT 2006 Time Trials Day

Friday 1st September 2006

Time	Action
8:30 – 10:45	Scrutineering
9:00-10:45	Supervised use of track for testing purposes.
11:00-2:00	Time Trials
2:00-3:00	Supervised use of track for testing purposes.
3:00	Track is Officially Closed

SCRUTINEERING

8:30 - 10:45 am

Each solar racing car will need to go through scrutineering. This is where race officials look over the car and make sure that it meets all the regulations. This process can take quite a while and some teams have needed to make modifications to their cars at this point. Please double check that your car meets specifications at least a week before the race. This will allow you plenty of time to make modifications if they are needed.

SUPERVISED TRACK USAGE

9:00 – 11:00 am & 2:00 – 3:00 p.m.

Once your car has made it through scrutineering you can test your car on the actual race track. This can help iron out any imperfections in your car design on the actual racetrack. Don't forget to bring all your tools and building material. For any emergency last minute items there is a *Hobby World* about 2 km from campus at 397A Anzac Parade, phone 9662 1025.

SUNSPRINT RACE DAY 2006 RACE DAY SCHEDULE

Saturday 2nd September 2006

Time	Action
8:30 - 10:30	Re-Scrutineering/Tee Shirts
10:00 – 10:30	Group Photographs
10:30 – 10:45	Race Briefing
10:45 - 12:30	Eliminations
12:30 – 1:30	Lunch
2:00 - 2:30	Finals including Novice Finals
2:30 - 3:00	Award Presentations
3:00 - 3:30	Race Debrief

RE-SCRUTINEERING

Competitors need to be at UNSW *no later* than 8:30 am with re-scrutineering starting promptly at 8:30 am. Re-scrutineering is a quick check to make sure that nothing has changed on the car from since the time trials on the previous day. SunSprint is on a very tight schedule! **PLEASE BE ON TIME.**

TEE SHIRTS & PHOTOS

Once a team is through scrutineering the *entire* team needs to go to the Tee Shirt area to receive their tee shirts. Group photographs will be taken at 10:00 am. These photographs will appear on the SunSprint 2006 web pages.

RACE BRIEFING is at 10:30 – 10.45 am

Each team must be ready to race **THREE RACES IN ADVANCE!** Only two minutes per time trial is available. **Three races in advance are less than 6 minutes away from racing!** Listening intently during the race briefing will give your team the information necessary to be at the gate at the right time. **A single missed qualifier race could spell disaster for your team.**

ELIMINATION

Once qualifiers have finished, the elimination round starts. Again, be ready **THREE RACES IN ADVANCE!**

FINALS

For those teams that make it into the finals: be ready **THREE RACES IN ADVANCE!**

***** IMPORTANT! THE PIT AREA *****

ONLY COMPETITORS WILL BE ALLOWED IN THE PIT AREA. This means that teachers, parents, friends and well-wishers will **not be allowed** into the pit area. If your car needs mechanical attention it will be up to you and your team to supply the required service. No one from the outside will be able to help. **You may ask for advice from the outside but no one other than you and your teammates may touch your car once it is scrutinised and residing within the racing area and pit.**

TABLE AREA

Each team will be allocated a table in the pit area. Bring all your tools into the pit area so that you may perform mechanical repairs as needed.

SECURITY

Teachers and Teams are requested to bring a box large enough to hold all their valuable equipment. Please guard your security box.

POSTAL ENTRIES

If there are any teams that wish to post their cars to UNSW for a SunSprint race official to race it on their team's behalf : the car must be received by SunSprint officials on or by Tuesday 29th August but please try to have it delivered prior to this deadline.

The postal address is:

Prem L Kumar
Faculty of Science
Level 2 Dalton Building
University of New South Wales
Sydney NSW 2052

You must advise us in advance of your intent to post your model solar car to us via fax to Prem Kumar on 9385 7920.

CAR NAMES

You will need to officially divulge the name of your car during registration. Car numbers will be issued at this point according to the procedure outlined below.

NOVICE & OPEN

How the competition is run

When the cars arrive for scrutineering, they will all be examined and given a car number. All the cars in the Novice class will be given race numbers 100 and above, while all the Open class will be given race numbers 1 and above.

During the initial heats, all the Novice cars will be grouped together so that the Novice cars will be competing against only Novice cars for **at least three heats of races**. At the same time those in the open class will also be competing in their Open heats.

Upon completion of all the heats, all entrants (Novice and Open) will be ranked based upon number of victories (as with prior years). As there will be groups of only novice cars in the heats, then there is sure to be some high qualifying novice cars.

Based upon this rank they will all race against each other in the knockouts, and the winner of the novice class will be the entrant that progresses furthest through the knock-out. In the event that two or more novice cars are eliminated in the same "final" round, there will be a final race between the two or more novice cars to determine the winner.

This allows the Novice entrants to race against each other and still allows the possibility for them to win the race outright. It also selects the best three cars and a wildcard for the Australian-International Model Solar Car Challenge, while not disadvantaging the entrants in the open class.

Novices

Schools that enter novice teams are reminded that the goal of the day is to participate rather than to win. We have seen many teams with quite reasonable vehicles want to pull out just before a competition. This is usually just after they have seen fast moving cars from teams that have had many years racing experience or teams using SunSprint as their Design &

Technology major project. The novice classification has been established to help let two competitions occur on the same day with the two groups having widely different skill bases. Even if your students' vehicles just tractors along rather than flies have them come, experience the event and learn from the other students. **NOTE: All Novices build their cars out of Balsa Wood.**

• 50% Novice

Good news for those in the novice category: approximately half of the SunSprint entries are in this classification so there should be some well-matched and exciting competition on the day. Novices will compete against novices.

• Advice for Possible Rain

We have had excellent blue skies during the last few SunSprints but you never know what will happen on the day. During the National Competition in 2002 a team from Victoria had used a gear ratio such that their car would tractor slowly along the track. It was a bright blue day and other cars passed this car like it was standing still. Had it been a cloudy day this car may have won the competition (the fast cars probably wouldn't even budge in the poor light conditions). Place a sheet or two of tracing paper on your solar module (to make it seem like a cloudy day) and see if you can select a gear ratio that will allow the car to tractor along. Bring this gear along on race day and if it is cloudy or rainy day you are still in the competition. The car that tractors the fastest or furthest would be the winner.

The SunSprint Model Solar Car Challenge will run rain or shine. Please bring an umbrella and/or a raincoat.

NOTE: VERY IMPORTANT

The race runs the full length of the track plus about 10 meters. **DO NOT stop your car or pick it up until it has gone through the timing gate!** We've seen several teams remove their cars early thinking that the race was finished. This action can disqualify your team.

Lunches

On both the Track Open Day and the SunSprint Race Day registered team members will get lunch vouchers to Clem's BBQs on site. We will have the same number of lunch vouchers available as students registered for tee shirts. Students must actually be present with teachers to receive the vouchers.

Please read the 2006 Regulations and pay special attention to the following (they have been changed from last year) :

5.3 Panel Power Output

Solar panels will have their output power measured by the scrutineers using a light box with an output of approximately 1 Sun. Panels must be presented in their ready to race form. For curved panels the panel output will be determined by placing the panel generally parallel to the top of the light box. For further details of determining panel performance, see Section 8.6.

7.5 Formal Stopping Procedure

For preliminary round robin races, any stopping procedure may be used, at the discretion of the race organisers. For all races in knockout rounds, as designated on the day of the event by the organisers, after crossing the finish line, each car will run into a styrene foam block. The blocks, one on each track, will be 400+/-10mm long, 250+/-5mm wide and up to 180mm high, and will be ballasted to weigh 650+/- 5gm. The blocks will have a groove, approximately 18 to 20 mm wide and of similar depth, cut in the bottom so that they should slide along the channel without jamming. The blocks will be placed at the end of the first bend, approximately 32 metres from the start line, by approved marshals, after the car has passed that line on the final lap. When the car hits the block, it will then push it along the track. The car must not be handled in any way until either coming to rest or passing under the bridge. The egg (see 8.20) will need to be restrained so that it is not dislodged nor damaged. The cars will need to be able to withstand a number of such collisions during the course of a multi-race event. The ON/OFF switch on the car may not be used to disconnect the motor and no other means of slowing the car external to the car (e.g. dropping an opaque cloth onto it) shall be used in those races designated to end with an impact. Cars may be fitted with an additional microswitch which disconnects power to the motor upon impact with the block, but no human intervention is permitted until the car comes to rest or passes under the bridge.

8.6 Solar Array and Support Structure

The solar cells connected together to provide the power which drives the car will be referred to as the array. That complete unit on which the photovoltaic cells (the array) are mounted is the array support structure. This structure must be fully removable and may form part of the car body, but must not form a part of the chassis, cabin or side panels as defined in 8.17, 8.22, and 8.19. The array support structure may carry the ON/OFF switch, and may allow for

varying the voltage by means of a mechanical switch controlled by the team prior to the race start, but all other mechanical, electrical or electronic devices must be separate from the array support structure and supported by the chassis. The panel must be robust enough to enable handling by the scrutineers and officials. The organizers will accept no responsibility for any damage to the solar cells or the solar array due to normal scrutineering procedures. NB. Bare silicon cells are highly prone to breakage and are therefore discouraged.

When being scrutineered, the panels must be presented for light box testing with a maximum of 25 volts open circuit and 2.0 amps short circuit. Otherwise they will be assigned the value:

$$\text{Power} = (\text{open circuit voltage}) \times (\text{short circuit amps}) \times 0.80 \text{ watts.}$$

They must register a power of less than 12 watts. A car using a panel registering a power of >12watts, will automatically have a 200gm weight penalty applied to it, as well as having to be modified to meet the 12 watt limit. Teams should check their arrays in advance, either using a light box or full sun conditions. Teams should ensure that standard panels (eg Solarex MSX 10) are rated by the manufacturer at <12 watts, which almost always exceeds the output measured on the light box. Standard panels rated at >12 watts and measured as >12 watts will not be allowed. If an array built up from individual cells exceeds 12 watts, cells will have to be completely removed from the array until the panel generates power of less than 12 watts. If a team wishes to modify a panel to produce a lower power for any reason then cells must be completely removed from the array. Simply bypassing or masking off cells will not be permitted under any circumstances.

Curved, stepped or multi-planed arrays should be able to be re-configured to within 20mm of a single plane for the purposes of power measurement. If this is not possible, the scrutineers reserve the right to calculate a maximum power value based on extrapolating measurements taken from one section of the array to the whole area.

8.8 Solar Array Wiring

All wiring on the solar array must be visible to the scrutineers, so that wiring problems can be easily identified and problems resolved. Teams using panels of their own construction or modified commercial panels must provide a wiring diagram showing all cells, switches, plugs, sockets, etc., to assist in the scrutineering process. Where the panel has multiple outputs, teams must supply suitable

open wiring, complete with diagrams, to provide scrutineers with a single pair of connections marked +ve and -ve and able to directly attach to the alligator clips on the power measuring equipment.

Where different power readings are obtained using different switch settings, the highest value obtained shall be used. If the panel has multiple connections, the power will be measured on each connection and the values obtained added

8.16 Steering

Each car must incorporate a means of steering along the guide channel of the track (as per *Diagram 1*).

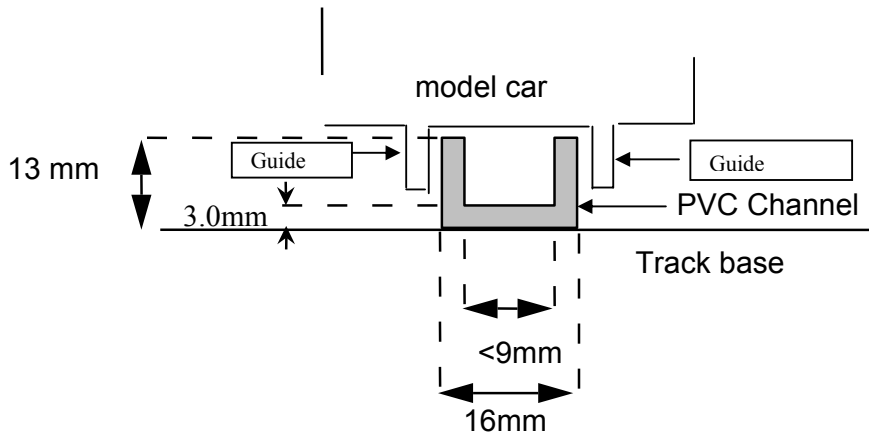


Diagram 1 Two guides outside the channel

Section 4.3 specifies any track variations that may be encountered. The steering mechanism must be via guides designed to run outside the channel. Use of an active (moving) steering system will be viewed favourably when choosing quality engineering design awards.

8.17 Chassis

The car must have a rigid chassis independent of the solar array and its support. The car must have all components, such as the driver's cabin, wheels, guides, motors, side panels and cargo area, etc, attached to the chassis. The driver's cabin, side panels, cargo area and any other bodywork may form part of the chassis.

8.18 Cargo area

The car must have an enclosed cargo space with a floor attached to or as part of the chassis. The space must be located behind the driver's cabin. The space must be sufficient to fit two (2) full unopened 375ml aluminium drink cans beneath the solar array. At least one of the cans must be positioned transverse to the direction of travel. As there are minor differences in the ends of cans, a standard can will be assumed to

be a solid cylinder 65mm diameter and 130mm long. The solar array structure may form the top of the enclosure. With the solar array structure removed, the floor must be capable of supporting two full cans, and the car must be capable of free and stable movement on a flat surface with those cans in place. During races, one can, empty but for ballast, must be carried within the space.

8.20 School and Car Name

Each entry must have its school name (possibly abbreviated) and car name shown on the car in letters at least 10mm high and visible when racing. These can be attached to any part of the body, other than that area designated as the side panels described above.

8.22 Driver's Cabin

Each car must have a fully enclosed cabin at the front of the car in which the egg sits vertically (see attachment A). The cabin must be sealed when racing so that if the egg breaks nothing is spilt onto the track (such sealing may be adhesive tape). The cabin must also include a transparent (not translucent) windscreen

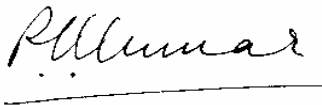
conforming to drawings in Attachment A. Two frame members up to 4mm wide may be incorporated into the windscreen. To allow the driver to operate the controls there must be at least 10mm clear space between the driver and

the windscreen over the 180° arc of visibility specified and 3mm head room (see Attachment A). **NB:** this means that nothing but air be between the egg and screen over this area.

To make sure that we do not run into overtime, please notify your spectators and well-wishers to stay away from the pit area (read the rule for pit area). We do not want to penalize any team especially after they've put in so much hard work building their cars to race at SunSprint.

Should you require any information or advice or find anything confusing in this newsletter, please do not hesitate to phone, fax or e-mail.

With kind regards

A handwritten signature in black ink, appearing to read 'P. Kumar', is written above a horizontal line.

Prem L Kumar JP
Marketing Project Officer (Outreach)
Faculty of Science
The University of New South Wales
Sydney 2052 NSW Australia

Phone : + 61 2 9385 7311
Facsimile : + 61 2 9385 7920
E-mail : prem.kumar@unsw.edu.au
WWW : <http://www.sunsprint.unsw.edu.au>

Please ensure that your car meets the following scrutineering requirements

3.6	A2 poster supplied	
8.1	Car not commercially made	
8.2	Car Max Size (mm): 650 (L) x 180 (H) x 320 (W)	
8.3	Approved power source	
8.4	Power limit – 12 watts	
8.5	No energy storage systems	
8.6	Solar array and array support structure Weight Solar module with ON/OFF switch	
8.7	Solar array and support structure removal	
8.8	Solar array wiring	
8.9	Solar panel cover	
8.10	Array and array support structure weight	
8.11	Calculated Ballast Weight (see Regulation 8.18)	
8.12	Car fitted with ON/OFF switch to minimize car set-up time	
8.13	Car wiring must be reasonably visible	
8.14	Motor Manufacture & Number present	
8.15	Wheels: >1mm wide, or Radius 0.6mm on the running surface	
8.16	Steering mechanism – guides to run outside the channel	
8.17	Rigid Chassis with all components attached	
8.18	Cargo area - ballast easily removable (if required)	
8.19	Side Panels area (min height 75mm)	
8.20	School name and car name at least 10mm high	
8.21	Egg presented by Committee	
8.22	Enclosed cabin, visible driver, passenger space	

Vehicle Meets Race Requirement YES NO (circle one)

Authorised to race by :(Signed) _____