



RENAULT RS01

THE SUPERB FRENCH GT THAT IMPRESSED ALAIN PROST WAS DESIGNED IN COLLABORATION WITH DALLARA ENGINEERS IN VARANO

INDY LIGHTS

THE INDYCAR FEEDER SERIES STARTS A NEW ERA WITH BRAND-NEW DALLARA IL-15 DISCOVER MORE INSIDE



ROSETTA

THE SPACE PROBE THAT JUST LANDED ON A COMET USES A SPECIAL TECHNOLOGY SET-UP BY DALLARA TECHNICIANS

MOTORSPORT ACADEMY

EXPERIS MOTORSPORT, DALLARA JOIN FORCES TO SHAPE UP THE FUTURE WORLD RACING BRAINS AND RE-LAUNCH THE EMILIAN MOTOR VALLEY



Indy Lights

Born to seduce

DALLARA USA IS EVERY DAY MORE AN INTEGRAL PART OF AMERICAN RACING, AND THE INDY LIGHTS REVAMP PROGRAM FEATURE THE ITALIAN COMPANY AS ONE OF ITS MAIN STARS WITH THE DESIGN OF A NEW CAR FOR THE 2015 SEASON. STEFANO DE PONTI GUIDES YOU THROUGH THE BIRTH, THE DEVELOPMENT AND THE DELIVERY OF THE CAR - WHICH WAS LABELED AS "SEXY CAR" BY PROMOTER DAN ANDERSON - AND TELLS US MORE ABOUT HOW THE FACTORY'S TWO BASES IN ITALY AND AMERICA. A REALLY INTERESTING RELATIONSHIP ALSO FOR TEAMS WITH GREAT RACING TRADITIONS LIKE CARLIN MOTORSPORT

The 2015 Indy Lights season is getting closer, and everybody is ready for a new season of the IndyCar feeder series. The last tests are scheduled in these days and in January, and the much-anticipated next season of the series, promoted by Dan Anderson, will be starting in spring. Stefano De Ponti, who heads the USA operations of Dallara, we'll discover how the collaboration between Varano and Indianapolis developed, and understand what we can expect for a series aiming for a re-launch. «*The structural parts, the most important for the safety of the driver, like the tub and the front nosecone are built by Dallara in Italy - explains De Ponti - the other components are made in the USA. Some are built here at our headquarters, while one third of the total parts come from local suppliers, especially in Indiana. Dallara USA is still a pretty new company but we're improving our structure and a specific area with an autoclave, oven, cutting table, modeling*

and carpentry is available to produce the composite parts». Head of the project is Antonio Montanari, whose interview is also included in this issue, and Indianapolis hosted an interesting Italian-American task-force. «*Here at Indianapolis - continues De Ponti - I contacted an engineer, Alex Timmerman, who acts as a technical reference for Dallara USA. He deals with Project Leader Montanari and is the American interface regarding the customer service with the Indy Lights teams and promoters. We also involved Owen Snyder. In addition of being the brother-in-law of the Michael Schumacher of Sprint Cars, Steve Kinser, he won Indy twice as a crew-chief of Al Unser Jr and Eddie Cheever. Snyder followed the assembly and the technical-logistic aspect of the parts. Considering quality control, administration and logistics, four people were involved full-time here in the USA».* «*When we design a new product we always try to get the best cost/benefit*

ratio - says De Pont - in America, Dallara is on the front line in terms of customer service. We don't have distributors for the spare parts, or relationship with the teams is direct. If something doesn't work, we are the people who have to solve the problems. Here everybody likes to tingle with the products, staying on the edge of the rules. We have to make sure that the car has a considerable quality and that it's safe. And given that the quality always has a price tag, our challenge is to keep the costs down. In the United States, as everywhere, due to the world crisis there are less and less sponsor circulating. Although motorsports didn't lose interest in general terms, the other disciplines represent competition in terms of securing the funding». The key of the new Indy Lights success also relies on a ladder project that can take the American drivers by their hand and help them learn in an effort to reach the top level in open-wheel racing, IndyCar.



lasted until the 2014 season - and the goal was to draw drivers from Sprint Car racing and bring them to single seaters and NASCAR. For several reasons, this plan didn't work. Thanks to an external promoter like Dan Anderson, the championship is now looking forward to a new path. It's a good instrument to learn the driving technique on the ovals - don't forget that the Indy 500 is still the main race of the IndyCar season - and to familiarize with the American circuits that are very different from the European ones in terms of layout, bumps and type of asphalt. The arrival of Carlin means that the American way of racing is getting rediscovered. The classic approach was like: in America you race on ovals, with concrete walls that can get you hurt. But we must not forget that Indy Lights is still the second fastest series in the world, with one-hour races and average speeds of 185-189 miles per hour. A good Indy driver must learn how to drive fast with 15 or 16 drivers at his sides, relying on his spotter, who tells him what happens around him from the grandstands and also suggest the race strategy. This is a completely unknown element in Europe, and it surely increases the competence level of a driver».

The Indy Lights development project was also able to benefit from the Dallara Simulator installed earlier this year in its American version. «The Simulator goes really well - confirms De Ponti - and we are using it a lot. In these days we are planning an Open Day with a car model available to drivers and engineers of Indy Lights and Formula Mazda. In addition to that, Louis Scwitzer's nephew will be presenting a plate dedicated to his grandfather». Dallara is each day more committed to extra-racing projects and there is plenty of work for De Ponti and his staff.



Stefano De Ponti, Head of Operations, Dallara Usa, Together with Al Unser and Andrea Toso in front of the brand-new simulator launched in Indianapolis

«Everything that was designed for IndyCar in terms of safety and worked was implemented on the Indy Lights, if the rulebook allows. Regarding the safety aspect, the car is actually a mini-IndyCar. The project is managed by Dan Anderson, who is a racing manufacturer and fan and imagined the ladder to the IndyCar. An educational program for mechanics, drivers and engineers that can take them up to the IndyCar Series. He and Tony Cotman, the Technical and Race Director for the Indy Lights, kept in contact with Antonio Montanari and his team while they designed and built the car. It's a very interesting project, and a less complicated one from the "political" standpoint because there are no manufacturers involved. We submitted some renderings explaining the possible solutions to Anderson, and he chose what he defined "sexy car". We already delivered several units. Last week 3 or 4 left to complete the first 10-car bench that will be testing on the 16 and 17th of December at Palm Beach».

The start of the season will be on March 28th at St. Petersburg, Florida, and the addition of prestigious British team Carlin Motorsport is something to rely on.

«I can anticipate that there will be a great field at St. Petersburg - confirms De Ponti - and the arrival of Carlin Motorsport is great. It shows that they found in Indy Lights the right package for their USA activities. And it definitely opened the door to more additions. The way of imagining racing in the USA is different compared to Europe. The average American is conservative and once there is a good product, is kept for years and years. There is slightly less development and innovation compared to Europe, but it's a successful business model».

The Indy Lights project also represents an interesting opportunity from a driver's point of view as it deviates from the original project. «The Indy Lights spirit was created in 2002 - the previous car was delivered that year and



«Safe
here's the



er and more nimble, future Indy Lights»

ANTONIO MONTANARI OF DALLARA HAS FOLLOWED THE DESIGN AND DEVELOPMENT OF THE IL-15. THE NEW CAR WILL BE THE STAR OF THE THE NEW SEASON FOR THE INDYCAR SUPPORT SERIES, STARTING IN MARCH FOR AN HIGHLY-ANTICIPATED RUN. HE EXPLAINED US ENGINEER EXPLAINED US THE PHILOSOPHY AND THE CHARACTERISTICS OF THE NEW CAR, PLUS HOW IT WAS WELCOMED BY DRIVERS AND TEAMS



Antonio Montanari, can you tell us how the IL-15 will be?

«It will be a completely new championship with new teams including ones from Europe. The Indy Lights was a minor championship with a 13-year-old structure that clearly had lost most part of his highlights and charm. A strong restyling was needed, and there were modern standards to comply with. The car is an huge step forward compared to the previous one. The experience acquired with the new IndyCar has been really important

and its influence has been entirely transferred to this project. Actually, this is a miniature IndyCar. With a weight of 600 kilograms and 450 horsepower, plus 50 coming from a push-to-pass system and a paddleshift gearbox, we are sure that it will provide a great show and will help train the drivers for the upper category».

How does it differentiate itself from the European cars?

«From the outside they are pretty similar, but the safety rules used are the same of

IndyCar. It will also race on ovals, so the race dynamics are quite different compared to the European tracks. The suspensions allow a wider range of adjustment to set them up properly for this kind of tracks, where you race without a differential, with wheels of different sizes on the two sides and with a positive camber on the left. So the suspension components don't need to get replace from road circuits to ovals so the running costs are kept down. The teams will receive an aero transformation kit to adapt the car to the speedway use.



It's much more similar to the European single seaters compared to the previous one, that was designed to run only on ovals and was then adapted to roadcourses. The roll-bar was designed to resist to the same loads of an IndyCar despite the reduced weight, the anti-intrusion zylon panels were extended and the sides of the cockpit comply with the F1 standards for more side protections. Like its bigger sister, the inside of the cockpit was fully covered with 5 centimeters of expanded polypropylene. The same protection material used on the inside of the helmets».

How did you integrate and optimize the production of the tub in Italy and the other components in Indiana?

«Our headquarters in Indianapolis are completely productive and operational, so the integration wasn't a problem. The contact and the communication is constant, with the current information systems everything is shared in real time and it seems there is no distance. Regarding the production, we divided the tasks right from the start. The suspensions and a part of the carbon fibre components are produced in our Indianapolis headquarters. Especially regarding the consumable materials, we hope to progressively move the production of spare parts to Dallara LLC in order to improve the efficiency and the customer service».

Does it have the same cockpit as the upper category?

«The tub has a very similar shape and the safety equipment are the same. In agreement with Andersen Promotions, we adopted the same homologation despite the lower performance: safety comes first! The most interesting thing is that the inside shape and room of the cockpit are exactly the same for the two cars. So if a driver will have the chance to test on an IndyCar, he will be able to bring his seat which will fit on both chassis».

This is a clear advantage and an additional charming feature».

What was the contribution of the simulator?

«The simulator will definitely provide a lot of help. The implementation of the model is almost ready. Tristan Vautier and Josef Newgarden contributed to validate and develop it, providing a key feedback as they compared the car's response in the simulator and on-track. The simulator version will be available for the teams before they will be able to put the car on the track. So it's an huge resource. It will be extremely helpful with a car that is completely new, as said before, for the drivers, teams and engineers. Taking full advantage of it will be up to the users' fantasy».

How did the first tests look like? What was the feedback of drivers and teams?

«The new Indy Lights car has been really quick right from the start, and the feedback of the drivers very positive. They found a lighter and more nimble car compared to the previous one. It reacts better to the driver inputs. The testing program started with a little shakedown at Putnam Park, close to Indianapolis, before continuing for most part of August with Tristan Vautier and Conor Daly. The distance covered was comparable to what we will achieve during one season and no issues emerged. The scheduled was completed on the 6th of September with Scott Dixon, James Hinchcliffe and Gabby Chaves at Indianapolis. On the Indy oval, the Colombian was also able to break the previous track record. The teams

provided the new car with a very warm welcome since its display at the Indy 500 pagoda in May. During testing, teams were rotating in attendance to have first-hand impressions and gather technical information. There is a lot of interest and we are really satisfied because the car matched all the early expectations».

When do you expect to deliver the cars?

«The first ten cars have already been delivered to the teams starting from the last 14th of November, and more of them are ready or currently being delivered. Everything is ready for testing and for the next season. At this moment, twelve teams have confirmed their participation. Our American colleagues and us are working closely to provide the teams with all the assistance they need to prepare the cars».

How does your road-map to the first race looks like?

«There's currently a lot going on with the preparations as there will be several tests in January and February at Palm Beach, Homestead and Barber, both on ovals and road courses. The 2015 calendar features 16 races, the first being on the 28th of March at St. Petersburg. I can't wait!».



The new Indy Lights car during its reveal at the 2015 Indy 500



2014 Dallara champions



INDYCAR

Dream Power

Finally he did it. And the excitement flowed at Fontana, where he grabbed the 2014 IndyCar Series title with a ninth place. **Will Power** broke in tears: the 33-year-old Australian chased his dreams with a passion over the years and even complicated his own job in several occasions. In addition to that, he had to face top-caliber rivals like Dario Franchitti and Ryan Hunter-Reay. But this time in California it was the right time to make a dream come true. He also dreamed about playing battery in a rock band, and now is looking forward to beat his rivals again to go back-to-back for the Penske organization. In 2014, he alternated masterclass runs with some mistakes (Pocono, Sonoma, Houston, St Petersburg, and Indy) that also brought unwanted penalties. His 2014 tally includes three wins and seven podium finish. Plus, a well-deserved and long awaited title.





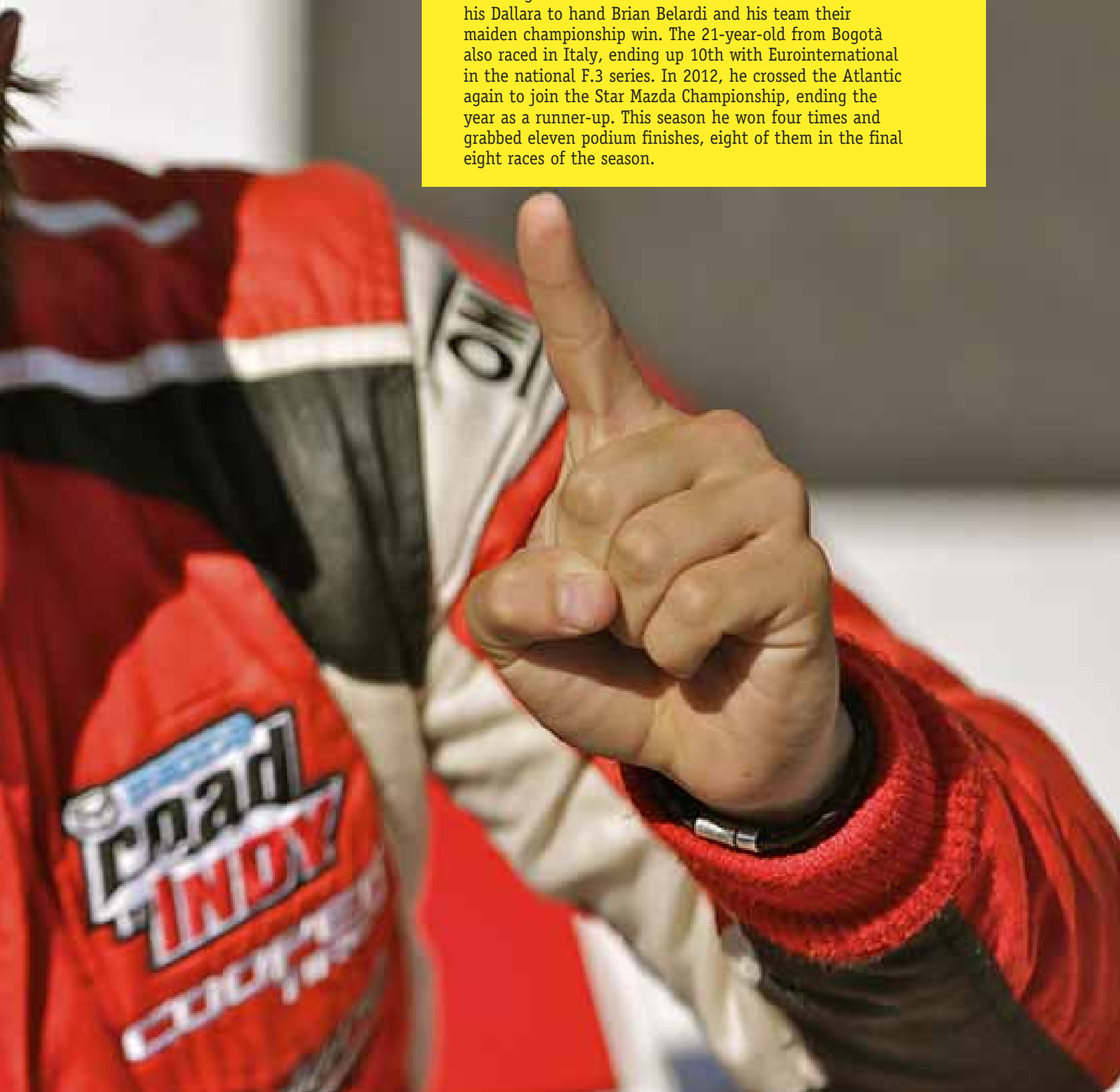
2014 Dallara
champions



INDY LIGHTS

Chaves the sledgehammer

Consistency and conviction. These are the skills that enabled **Gabby Chaves** to cruise to the 2014 Indy Lights title. After climbing to the top of the points charts in the first round of the season, the Colombian was able to secure the title on his rival Jack Harvey at the second tie-breaker. While the two had the same number of wins, Chaves scored six second place finishes on his way, including one in the last round of the season. He mastered his Dallara to hand Brian Belardi and his team their maiden championship win. The 21-year-old from Bogotá also raced in Italy, ending up 10th with Eurointernational in the national F.3 series. In 2012, he crossed the Atlantic again to join the Star Mazda Championship, ending the year as a runner-up. This season he won four times and grabbed eleven podium finishes, eight of them in the final eight races of the season.





2014 Dallara
champions



Pal



GP2

Palmer follows in Hamilton's footsteps

Son of former British F1 driver Jonathan Palmer, **Jolyon Palmer** is one of the most interesting prospects of his generation, and confirmed the feeling by winning the 2014 GP2 Series title. He mathematically clinched the crown in Sochi with one round still to go, winning race 1 in a clean fashion. He was the first Brit to accomplish the feat after Lewis Hamilton in 2006 and this is definitely a good omen. Driving a Dams-prepared Dallara, Palmer has been off to a great start as he won race 2 of the opening round in Bahrain, cruising to the lead in standings and never looking back. He scored four wins, three pole positions, twelve podium finishes, seven fastest lap and a record amount of points for the series. His 2014 season couldn't have been better.



GP3

Lynn, consistency from Lo

Like Lewis Hamilton in Formula 1 and Jolyon Palmer in GP2, the 2014 GP3 champion came from England, precisely from London. **Alex Lynn** drove the Carlin Dallara to title and succeeded to an exciting list of previous champions including Esteban Gutierrez, Valtteri Bottas, Mitch Evas and Daniil Kvyat. Three of them will be running in Formula 1 and that can provide a nice boost for the future hopes of Alex. Born in 1993, Lynn is a part of the Red Bull junior program like fresh new F.1 additions Carlos Sainz Jr and Max Verstappen. He is a well-prepared and smart racer who left a strong impression when he won the 2013 Macau Formula 3 Grand Prix. This season he scored four wins - the first at his debut race at Circuit de Catalunya - two poles, eight podium finishes and two fastest lap. It was a pity for the missed win at his home track in Silverstone, but his consistency definitely paid off. We will definitely hear more of him in the future.



ndon





2014 Dallara
champions



RENAULT 3.5

Sainz, not junior anymore

Carlos Sainz, son of rally Legend Carlos Sr., was one of the favourites right from the start in the 2014 World Series by Renault 3.5. Unlike his dad, he joins the asphalt racing panorama instead of rallying and his career has finally taken-off. He was also the youngest title winner of the series, and the first one coming from the Red Bull developmental program. It's been a spectacular year for him, after winning the 2011 Renault NEC title and years of alternating between British F.3, European F.3 and GP3 Series. He was pretty nervous at the last race of the season, as his Formula 1 future had become unclear with the arrival of Max Verstappen in the Toro Rosso stable. He eventually managed to seal the deal, bringing his Dams-prepared Dallara to the title and defeating Roberto Merhi. His dominance included 7 wins, 7 poles, 7 podium finishes, 6 fastest lap. Enough to finally secure a ride in Formula 1 for 2015, at Toro Rosso. For the joy of Carlos Sr.





F.3 FIA EUROPEAN CHAMPIONSHIP

Ocon, a successful rookie

It isn't easy to see a driver prevail at the end of his rookie season. **Esteban Ocon** was able to win the extremely tough FIA F.3 European championship at his first try, driving a Mercedes-powered Dallara for Italian squad Prema Powerteam and beating Tom Blomqvist and Max Verstappen. A Frenchman of Spanish descent, Ocon has been bred by the Junior Lotus program since his karting days, he was off to a phenomenal year. Coming from the F.Renault 2.0 where he proved stunning in the first two years, Ocon quickly adapted to the driving style required by a Formula 3 Dallara by working in an analytical fashion while being precise in testing, quick in qualifying condition and almost impossible to tame in terms of race pace. In the 33 races he entered, Ocon won nine times but made the difference with the 18 other points finishes he gathered throughout the season. The total, including the wins, go up to 27, an exceptional number. He cruised to title with one round to spare and also entered the international Macau Grand Prix. Unfortunately, he was involved in a contact with Blomqvist and forced to retire. Now Ocon is ready to join the GP2 Series with the Dams Renault-powered Dallara. At Abu Dhabi, he was one of the fastest guys on-track in collective testing, and at the middle eastern track he also had the chance to drive a Formula 1 Lotus. Just a few weeks earlier, he had sampled a 2012 Formula 1 Ferrari at Fiorano as an award for his European FIA Formula 3 title.





2014 Dallara
champions



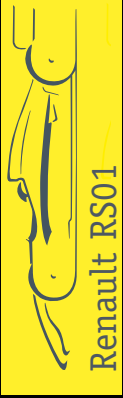


EUROFORMULA OPEN

Stuvik, the pioneer

He was on a mission. After having ended up the 2013 F.3 Open championship in second place, **Sandy Stuvik** continued to drive for the Italian RP Motorsport team, managed by Fabio Pampado, in an effort to seal the deal after being beaten by Ed Jones last year. Born in Thailand, Stuvik was competitive right from the start and set a tough standard for all his opponents. In the meantime, the single-make series promoted by GTSport and using Toyota-powered Dallara cars had changed its name, becoming the Euroformula Open. With eleven wins in sixteen races around Europe, it seemed pretty clear that nobody else could have beaten him though. Stuvik became the first driver from Thailand to win an international-level championship, a real deal for a 19-year-old youngster. In the offseason, he also spent some time driving more Dallara cars. First, the Zytek-powered one of the World Series Renault, then it was the GP2 Series. Stuvik has great dreams, he's committed and eager to shine on.





A “beast” for

BY WORKING IN COLLABORATION WITH RENAULT, DALLARA DEVELOPED THE SPECTACULAR RS01. THE NEW RACECAR HAS A PERFORMANCE LEVEL THAT CAN ALMOST MATCH A SINGLE SEATER OR AN LMP1, WITH A PHENOMENAL AERODYNAMIC CONFIGURATION AND TOP-CLASS SAFETY EQUIPMENT. IT'S INTENDED FOR THE MOST COMPETITIVE DRIVERS BUT ALSO FOR GENTLEMAN DRIVERS. DALLARA ENGINEER LUCA PIGNACCA, WHO TOOK CARE OF THE PROJECT, EXPLAINS MORE ABOUT ITS CHARACTER



everybody

With an exciting design, more than 500 horsepower, superb brakes and a 7-speed gearbox, the Renault RS01 is the state of the art in GT Silhouette racing. Luca, can you tell us more on the project's inception?

«I can really say that this project started from a clean sheet of paper, and was conceived to meet some very clear and fundamental goals. This is a great advantage. Renault asked us to develop a car that, in terms of performance, could be halfway between a GT3 and a DTM, ready to be used in endurance racing. Many of its

contents, like the engine, gearbox and brakes were already part of a great package designed by the customer. On one side, the mix of that features meant that we knew that our product would have been sensational. But on the other side, it was bound to be a huge challenge. The car would have needed to be light, with a perfect weight balancing but, more than that, with incredibly high-performance aerodynamics».

What are the most significant performance figures of this car, including the aero points of view?

«As I just said, the aerodynamics are definitely one of the car's strongest points, in addition to the vehicle dynamics optimized for the tyres. The balance between the two things has been reached to make the car fast and drivable also for the non-professional drivers. 1700kg at 300 km/h. This two numbers enable to understand the phenomenal level of downforce reached. This aerodynamic package enables the RS01 to reach 3 Gs of longitudinal and lateral acceleration. These values are more similar to the ones achieved by an open wheel car or an LMP than to a GT».





What were the requests of Renault? And what has been the most exciting challenge?

«The lap times to be achieved on-track and the respect of the style constraints established by the style center. These are two things that are difficult to keep together by definition. Making everything much more complicated was the fact that the exterior of a race car would have been developed jointly with the manufacturer, a pretty unique thing in motorsport. The Renault Style Center and our aero department worked without compromises. The style needed to have its key lines in place and the high performance. It wasn't negotiable. Tied in terms of the difficulty of the challenge, it was the time available for the development. We started from a clean sheet of paper during the last week of February and the car made it on-track during the last week of August. Only six months passed between the idea and the finished product. It seems incredible to tell but we managed to turn the project».

What were the technologies used by Dallara to develop the project?

«I would separate the technologies used to develop the product from the ones used to

produce it. From the development point of view we made massive use of 3D modelling, and in this case it had a further evolution intended to increase its importance in the different phases of the product's development. For example, during the assembly of the first prototype, the digital mock-up, which was directly available in the shop, was updated in real time to face all the necessary modifications. This way, the design and assembly departments were always aligned and consistent, which is a key goal for a project developed in just 6 months. Then, more fundamental instruments have been CFD (Computational Fluid Dynamics) for the aero and thermic development, and the intensive use of the FEA (Finite Element Analysis) for the virtual approval of every single component. From the product's perspective, we used several forms of composites: carbon fiber, fiberglass, kevlar that dominate the scene of the amount of technology used».

The car's design is quite interesting: can you explain how the side design was developed?

«The final aspect of the sides hasn't been changed too much compared to the first



Renault RS01

Chassis: Dallara

carbon fibre monocoque

Engine: Nismo V6, 3799 cm³, 24 valves

Power: 500 bhp

Torque: 600 Nm

Gearbox: Sadev 7-speed sequential

Tires: Michelin 30/68 R18 (AV),

31/71 R18 (AR)

Length: 4710 mm

Width: 2000 mm

Height: 1116 mm

Weight: 1100 Kg

Top speed: 300 Km/h



concepts that were showed to us by the Renault Styling Center. The side is definitely one of the most characteristic angles of the car. The entire fluid dynamics were designed to optimize the air flow under the car's floor. And a part of this flow fosters the two intercooler that are located at the sides. In order to make this delicate balance work, we had to smoothen and optimize every single millimeter of the first CAS (Computer Aided Style, that's how the stylists call their 3D models). The final result has been extraordinary both in terms of performance and style (but that's only an opinion). I'd say that one of our best abilities was to take advantage of the styling cues and give them the right value to reach the maximum amount of performance».

The name, which recalls the first Renault F.1 car born in 1977, the first turbo one, is due to fate or refers to a legacy?

«It isn't entirely due to fate, Renault strongly wants to highlight how important the new RS01 is, the first Renault-built sports car not coming from a road model. So they wanted to recall an equally-revolutionary vehicle like the F1 RS01».

The RS01 is bound to race alongside the World Series Renault 3.5 schedule. The two projects shared technologies, materials or solutions?

«As in any other project by Dallara, the level of sharing between the products is pretty relevant. Despite the fact that this is a sport car, more similar to a GT, there is a strong

relationship with the formula car».

What are the strongest points of the RS01 from the safety standpoint?

«The requirements made by Renault in terms of safety were really clear, exactly like for the performance. The car has a safety cell (monocoque plus steel safety cage), a front nose and a rear crash box with the same specifications of a Le Mans Prototype. In addition to that, it has side anti-intrusion panels which were mandated only recently in LMP1. The safety is one of the key requirements for Renault, and their cars must guarantee the highest standards available.

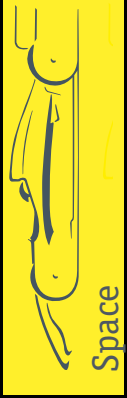
The fast and lucky drivers that will be driving them will have the chance to follow a training program for the Japanese GT or even for the 24 Hours of Le Mans. What are the most useful elements of the RS01 in terms of training pro and gentleman drivers?

«The car has a level of downforce and grip in general that enables it to reach lateral accelerations superior to the ones of a GT3 car. This allows the driver of an RS01 to prepare well for the Le Mans, DTM and Super GT cars. It was also a great surprise (the car is currently being developed on-track) to see the gentleman drivers that had the chance to drive the RS01 show a good driving ability and an optimal physical strength. I would say that the RS01 is a great car to aim at Le Mans, DTM and Super GT for both pro racers and gentlemen».



«Renault Sport RS01 is a spectacular race car, with the real GT spirit. It promises a great feeling for the driver. For its high-level characteristics, the Renault RS01 showcases the great qualities of Renault Sport, and the ability to develop racing cars able to highlight the future stars of GT or Endurance».

Alain Prost



Rosetta

a race between the stars

ON THE LAST 12TH OF NOVEMBER, THE NOW FAMOUS SPACE PROBE LAUNCHED MORE THAN 10 YEARS AGO BY THE EUROPEAN SPACE AGENCY FINALLY TOUCHED DOWN AFTER CHASING HIS DESTINATION, THE "67P/CHURYUMOV-GERASIMENKO" COMET. ANDREA TOSO LED THE TEAMS OF TECHNICIANS AND ENGINEERS FROM DALLARA WHO COLLABORATED FOR THE PROJECT BY DESIGNING THE ELECTRIC DRILL THAT PERFORATED THE SURFACE OF THE SPACE OBJECT, TELLS US MORE ABOUT HOW THIS EXTRAORDINARY ADVENTURE DEVELOPED

Andrea, this time we will be talking about something out of this world. Also, we are old enough to remember the Space Race of the sixties and the seventies. Can you tell us more about the Rosetta mission?

«In the collective imagination, comets are mysterious celestial objects that can cause bad luck or revolutions. They have been studied from the astronomers since the times of the Neo-Babylonian Empire. Comets are not planets but resurface from nothing in terms of geography of the solar system; a comet, with its light tail due to the debris lost when it gets closer to the sun, lighten the sky and then goes back to the space obscurities. Yes, comets have a little impact on our everyday pace. The idea behind the mission is simple and intriguing because it starts from necessity and intelligence. "Less is more" is a famous catchphrase in sports and it's very fitting for this adventure. In the 2000's, the American Space Program was on an high with the Shuttle spaceships, the

International Space Station, and the plans to conquer Mars. On the other hand, the European Space Agency and its affiliates, including the Italian Space Agency, didn't get enough financing because the nations were divided almost on everything. The ESA was looking for a strong idea to justify a new challenge and put the European scientific community to test. The idea behind was: we can't go on Mars, we can't develop a system of geostationary satellites, is it possible to land on a comet with just a few economic resources and thanks to the ideas of our great scientists? The spark started from there. The Milan Politecnico University, and the Aerospace engineering department led by Professor Amalia Ercoli Finzi, proposed themselves as a scientific guide and found first the support of ASI, then the consensus of ESA. A specialized company by the name of TecnoSpazio, now Galileo Selex, received the task of coordinating the times, costs and specifications of the entire project in addition the retrieval of experienced companies in the field of

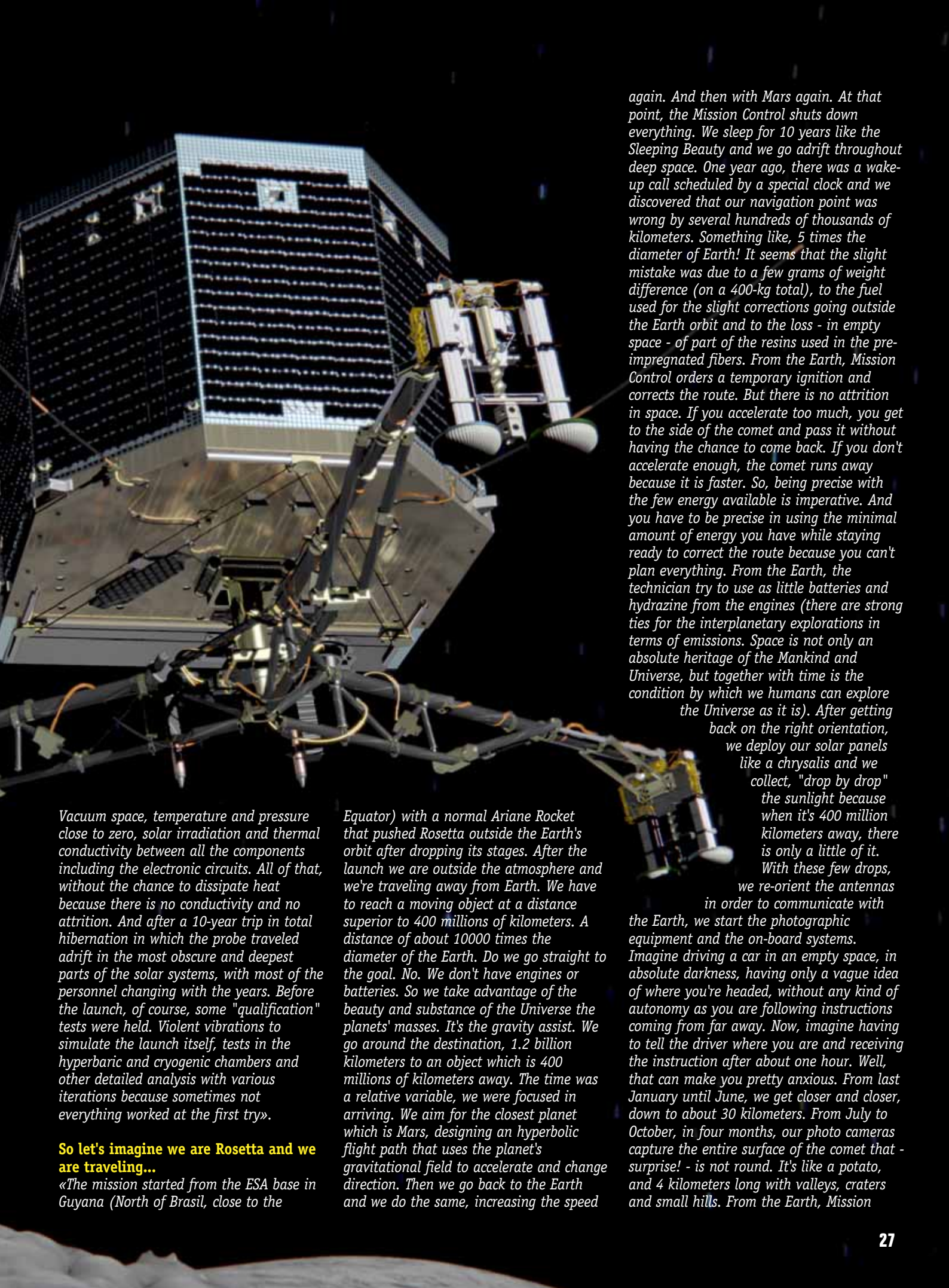
composites and light materials. By the way, transporting a single gram for a distance of 400 millions of kilometers is quite expensive if we think that even the light takes 20 minutes from there. TecnoSpazio started searching in the motorsport panorama because this is the closest field to Space explorations in

terms of materials, quality controls, manufacturing. The lever is only slightly simplified. Among many companies, the found Dallara. Honestly, we haven't been the first choice: Ferrari declined the offer because they were too busy in Formula 1».

It's been a phenomenal an fascinating challenge, especially for people who had Thor Heyerdahl and Neil Armstrong as their hero. What are the engineering challenges behind this kind of exploration?

«Of course, the technical challenge as ben for its most part... mental!. Imagine to conduct a mental experiment, without a laboratory able to replicate at the same time all the conditions in which the object must operate.





Vacuum space, temperature and pressure close to zero, solar irradiation and thermal conductivity between all the components including the electronic circuits. All of that, without the chance to dissipate heat because there is no conductivity and no attrition. And after a 10-year trip in total hibernation in which the probe traveled adrift in the most obscure and deepest parts of the solar systems, with most of the personnel changing with the years. Before the launch, of course, some "qualification" tests were held. Violent vibrations to simulate the launch itself, tests in the hyperbaric and cryogenic chambers and other detailed analysis with various iterations because sometimes not everything worked at the first try».

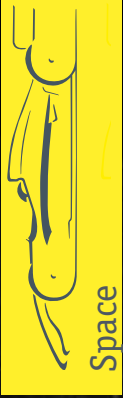
So let's imagine we are Rosetta and we are traveling...

«The mission started from the ESA base in Guyana (North of Brasil, close to the

Equator) with a normal Ariane Rocket that pushed Rosetta outside the Earth's orbit after dropping its stages. After the launch we are outside the atmosphere and we're traveling away from Earth. We have to reach a moving object at a distance superior to 400 millions of kilometers. A distance of about 10000 times the diameter of the Earth. Do we go straight to the goal. No. We don't have engines or batteries. So we take advantage of the beauty and substance of the Universe the planets' masses. It's the gravity assist. We go around the destination, 1.2 billion kilometers to an object which is 400 millions of kilometers away. The time was a relative variable, we were focused in arriving. We aim for the closest planet which is Mars, designing an hyperbolic flight path that uses the planet's gravitational field to accelerate and change direction. Then we go back to the Earth and we do the same, increasing the speed

again. And then with Mars again. At that point, the Mission Control shuts down everything. We sleep for 10 years like the Sleeping Beauty and we go adrift throughout deep space. One year ago, there was a wake-up call scheduled by a special clock and we discovered that our navigation point was wrong by several hundreds of thousands of kilometers. Something like, 5 times the diameter of Earth! It seems that the slight mistake was due to a few grams of weight difference (on a 400-kg total), to the fuel used for the slight corrections going outside the Earth orbit and to the loss - in empty space - of part of the resins used in the pre-impregnated fibers. From the Earth, Mission Control orders a temporary ignition and corrects the route. But there is no attrition in space. If you accelerate too much, you get to the side of the comet and pass it without having the chance to come back. If you don't accelerate enough, the comet runs away because it is faster. So, being precise with the few energy available is imperative. And you have to be precise in using the minimal amount of energy you have while staying ready to correct the route because you can't plan everything. From the Earth, the technician try to use as little batteries and hydrazine from the engines (there are strong ties for the interplanetary explorations in terms of emissions. Space is not only an absolute heritage of the Mankind and Universe, but together with time is the condition by which we humans can explore the Universe as it is). After getting back on the right orientation,

we deploy our solar panels like a chrysalis and we collect, "drop by drop" the sunlight because when it's 400 million kilometers away, there is only a little of it. With these few drops, we re-orient the antennas in order to communicate with the Earth, we start the photographic equipment and the on-board systems. Imagine driving a car in an empty space, in absolute darkness, having only a vague idea of where you're headed, without any kind of autonomy as you are following instructions coming from far away. Now, imagine having to tell the driver where you are and receiving the instruction after about one hour. Well, that can make you pretty anxious. From last January until June, we get closer and closer, down to about 30 kilometers. From July to October, in four months, our photo cameras capture the entire surface of the comet that - surprise! - is not round. It's like a potato, and 4 kilometers long with valleys, craters and small hills. From the Earth, Mission



Control looks for a flat spot to drop the probe on. The place for the "accometaggio", landing on a comet in Italian, is found and the first contact happens. It's the 12th of November. The probe is dropped by the mother-module. Since there is no gravity the risk is to bounce away forever. We have some pre-loaded harpoons that have to hook the ground (but without knowing its consistency). Once anchored to the surface, the phase of the mission that involves Dallara begins. Between the numerous optical, electrical and magnetic experiments, there is one that uses the drill designed and built by Dallara. The hollow tip penetrates the ground and brings them to some special "micro ovens" tied to a sort of a carousel that enables more experiments to be made. Last but not least, we send the data back to Earth. As the probe is pretty small, we have only 60 hours of autonomy to complete all the experiments that will eventually drain our residual energy. At that point, the batteries will be over forever. Is like a blossoming agave that explodes in his maximum amount of beauty and functionality before dying».

It's really fascinating. What kind of speed a probe like this can reach? What kind of engine propels it?

«In space you have to use what you got and bring with you everything you will

use in your mission. There are no guardian angels: "Out there, it is better to have in your back pack whatever you need to survive and work" (John Aldrin). The alternative is to rebuild, using the material you have on the spot, including the waste, what you may need (like in Apollo 13). It's like a group of sailors in the middle of the ocean, too far away from any port, that have to repair the ship. You can't rebuild everything, because everything deteriorates, like our life and identity. If you have nothing to repair the ship with, you take something out of the empty around you... and the sun will help you with its lively energy».

What are the most interesting materials and technologies used?

«I can remember two of the most interesting materials: Vespel, which is self-lubricating. When it penetrates the comet's surface, the tip produces attrition but you can't simply carry with you the grease, because it will disappear after 10 years in vacuum space. The other is Invar, a particular material which has almost no thermal expansion. We go back with Rosetta for a minute. For years and years we have been half exposed to the sun, while the other half face the dark space. Without Invar, or two sides will expand in a different way so they would assume different shapes. These expansions could ignite thermo-structural vibrations and

hamper the precision of the antennas that communicate with the Mission Control, or reduce the efficiency of our solar panels that need to collect every single "drop" of sunlight, or even generate catastrophic vibration ending in a collapse. This was exactly the argument of my degree thesis in Aerospace Engineering!»

What are the scientific, technological and also philosophical repercussions of the space exploration in our everyday's life?

«See, there are basically two principles that push us to knowledge. The first is the pursuit of knowledge and truth for the sake of themselves, as non-negotiable values needed to satisfy a pure and powerful curiosity. The other principle pushes us to go after knowledge as an instrumental value, in order to use it to improve the human condition. Both principles are substantial, and every single man is more oriented on one side or the other. What pushed Ulysses to abandon his son, father and wife? "That should have crown'd Penelope with joy / Could overcome in me the zeal I had / T' explore the world, and search the ways of life / Man's evil and his virtue / Forth I sail'd Into the deep illimitable main / With but one bark, and the small faithful band / That yet cleav'd to me / Our poop we turn'd, and for the witless flight / And over us the booming billow clos'd". What

was his plan? Getting back from there with new technologies and some know-how to get a competitive advantage? Nah, Ulysses knew he would have never come back».

Motorsports and aerospace engineering have always been tied: can you explain how?

«The Dallara group of Sailors who designed and build the drill was pretty lean. We worked on this project in our overtime. The production manager was Italo Montanari, who has retired now, was a man with great practical sense. I still remember his countryman's metaphors applied to the space exploration. Then there was a young designer, a surface specialist, a great mechanic, an engineering intern and me. No managers. Interesting isn't it? We managed ourselves amidst many other projects that were so urgent and important that now... nobody remembers about them. The "space drill" was a delicate and sober project, but with such a strong depth in time that it might now be remembered in the history of mankind as a courageous act of conscience. Like Galileo, who dared to observe the moon and the planets to discover that they weren't exactly perfect and spheric like the philosophers and theologians said. Like Werner von Braun who, after spending some terrible years in Germany developing the deadly V2 bombs, was welcomed by America. Thanks to the experience made with these instruments of death, he led the Space Program aimed at conquering the Moon».

How does an engineer get the idea to design a remote-driving racecar... well, spaceship?

«Maybe I had this temptation, or maybe presumption, twenty years ago when I



thought that the credit for the race wins were mainly to attribute to the engineers. Then I had the chance to drive a small racecar in an Henry Morrogh driving camp and I realized that the driver is almost everything. A remotely-controlled racecar is not a racecar. It's a toy that excites who drives it and bores all the others. And there are drivers behind the Rosetta Mission too. They are the Mission Control men in Darmstadt, the people from Politecnico di Milano and many others. Alone, Rosetta is nothing, it's only an object lost in space».

A brand-new blockbuster movie, "Interstellar," has hit the theaters. It tells about the research of an alternative living habitat, far away from us. Would we have the technology needed to accomplish that now?

«Of course, we have the technology, but we need a dream. A beautiful poem by Emily Dickinson said:

To make a prairie it takes a clover and one bee,—
One clover, and a bee,
And revery.

The revery alone will do
If bees are few.

If you think that a man walked on the Moon almost fifty years ago without super computers, Internet, GPS, carbon fiber, real-time processors, what could we do today? Looking for an habitat would mean that we had to run away from here. That we destroyed our own world, filled it with waste and made it dangerous to ourselves. Think about Easter Island. It's so far away from any shore that there is no chance to communicate. The inhabitants destroyed all the trees and reveries only to move their monolithic idols until everybody died. Now extend the same dynamics to the rest of us all. We live in a limited and finite world. It would be good to take care of it, "preserve what you can't generate».

So why this mission started in the first place?

«Because only by going back in time we can understand who we are and slingshot towards the future. With our means, all alone, we will never get there. If we only row, we are going to get tired soon. If we spread a sail and learn how to navigate, we are going to fly away with the wind. Comets, like asteroids, are pieces of debris dating back to the beginning of the solar system. If the analysis of the comet's ground will reveal the presence of amino acids, which substantially are ammonia under the form of dry ice, or the same composition of primordial crystals that we find on Earth, then we will understand the substance of stars, of Cosmos (which means Eternal Beauty) and ourselves. "We are all mad of stars!"

**Andrea Toso
and Stefano Semeraro**





IN HIS NEW HEADQUARTERS, EXPERIS MOTORSPORT, A SPECIALIZED DIVISION OF MANPOWER, WILL BREED HIGHLY-QUALIFIED ENGINEERS AND TECHNICIAN, AND FIND THEM AN EMPLOYMENT AMONG TEAMS AND COMPANIES. SERVING AS A MAJOR INSTRUMENTS WILL BE FOUR HIGH-LEVEL COURSES THAT WILL TAKE ADVANTAGE OF THE DALLARA SIMULATOR, WIND TUNNEL AND PERSONNEL OF DALLARA AUTOMOBILI, THE MAIN PARTNER OF THE INITIATIVE. ALONGSIDE THE HIGH-LEVEL COURSE THERE WILL BE A RE-QUALIFICATION PROJECT TO RE-LAUNCH THE EMILIAN MOTOR VALLEY

Motorsport Academy, a School of Talent

A Motorsport Academy that can breed highly-qualified engineers and technicians before positioning them into the job market, both in Emilia-Romagna and at international level, responding to the needs of the companies and re-launch the Italian Motor Valley. It's a dream that will be turned into reality from the next 23rd of December, when the new headquarters of Experis Motorsport, a division of Manpower, will be inaugurated. Their goal will be to train and deliver to the best motorsport companies in business the talents they need and often struggle to find. «I didn't hesitate to choose Dallara as a partner» said Luca Giovannini. The manager was born in Maranello and spent 12 years working for Ferraris, before becoming the Director of Experis Motorsport and the Motorsport Academy. «The base was an agreement over the values. People stand first and they have to be deep, have ideals, dedication, and passion for what they work on. These concepts are shared by Andrea Pontremoli and Filippo Di Gregorio».

The Experis Motorsport project starts from one of the guidelines that have already driven Dallara Automobili: innovation. «Until a few years ago, the teams and the companies wanted some highly-experienced people» continued Giovannini. «Now things have changed. Even in Formula 1, the rules are tighter and the budgets are so precise that made convenient hire people coming from outside motor racing but that have other competences. People who can plan and reduce the expenditures with a more industrial approach without losing the ideas and the craftsmanship that is proper of racing. So I asked myself: why I have to drive myself crazy to find competence that aren't available on the market when I can breed them in three years exactly like my customers want? So this large investment, about 300.000, was started in an effort to turn an idea into a practice that will change the world of education. For the first time we will provide, in the same offer, training and placement. Nowadays, you do either, while each time a new intern makes it to the Academy, he or she immediately becomes a candidate. We

kept them under control, verify their progress and select the ideal work opportunities for them. So at the end of his educational path we send them to the companies for rehearsal». The classes include maximum 15 or 20 people per course, with extremely high-level teachers and learning opportunities that nobody else can offer, mainly thanks to Dallara. «The courses comprise 140 hours in a weekend formula every two weeks. The guys will have to work very hard to reach the goal but who will succeed, will definitely get a great boost. The teaching body will be a mix of University Professors that already collaborate with the companies and professionals that already work in motorsport. Dallara will provide us the wind tunnel, their simulator and the technicians needed for the workshops. Of course, the program won't be available for everybody and the selections will be very tight. The candidates will have to send their resume to the research and selection team that will then go on with the placement. Once verified their





Luca Giovannini
Director, Experis
Motorsport,
with Dallara CEO
Andrea Pontremoli

suitability, the candidates undergo an interview with the representatives of Experis and the partners. At that point, a class will be defined and will have to be reduced because, in the end, all the participants will have to find a collocation in motorsports».
 The initiative, launched at the Motor Show of Bologna, has been really successful so far and counts more than 10 inscriptions per day. Alongside the high-level courses, Experis Motorsport will also provide qualification and re-qualification courses, aimed at the local needs. «In the next few years - continues Giovannini - we will be investing half a

million euros per year to train 250 people per season on the Motor Valley thematics. It's the largest private initiative launched at local level. Through specialized training, we want to be back as competitors of the British Oxfordshire, and Dallara also has a key supporting role. The reason we chose the Parma, Fornovo and Varano areas, is to take full advantage of the leverage provided by Dallara and the local companies».
 This way, a double channel is activated. The four high-level Academy courses («but starting from the second semester they could become six, with the introduction of new subjects related to electronics») will train technicians to

Formula 1 and to the automotive departments of great brands like Ferrari, BMW or Renault, will be paired with courses that will deliver specialized workforce to all the satellite activities.
 «A lot of courage was needed to create a project like this - concludes Giovannini - and it's incredible that an idea that first came out last summer is already starting in just five months. Training talents and investing at local level. These are the guidelines that both us and Dallara care for. And, as I said, we start from the same set of values».

Stefano Semeraro



Season's greetings

dallara