

# NATIONAL ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to Anna University, Chennai.)

## NEWS LETTER

VOLUME #1 ISSUE #1 July 2013



## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### ABOUT THE DEPARTMENT:

The **Electrical and Electronics Engineering** Department of **National Engineering College** is fully Equipped with state of art laboratories and its faculties consists of highly experienced professors, well qualified associative professors and dynamic assistant professors with commitment to give the young minds the very best they deserve.

### ABOUT THE ELECTRICAL ASSOCIATION:

Association of EEE organized a National level technical event “**ALTANZIA**”, **WORKSHOP, QUIZ, GUEST LECTURE, GATE CLASS**. The national level technical symposium had events like paper presentations, quiz competitions and other events.

The main aim of this symposium us to highlight the current status and the emerging trends of technology in various topics towards the betterment of industrial research and IT fields. It will be a great opportunity for students to exchange their experience through innovative ideas and make them acquired with latest technologies.

### *Events Organized by EEE Association:*

The Department of Electrical and Electronics Engineering of National engineering college, Kovilpatti, Organized a Two-days **National Level Technical Symposium “ALTANZIA”** on feb 1

& 2, 2013. The event was inaugurated by the Chief Guest **Sri.Purushothaman, Executive Engineer, Distribution (TNEB)**. The Chief Guest advised the students to take up the core areas as their carrier. Under the guidance of **Dr. Kn.K.S.K.Chockalingam, Director** and **Dr.P.Subburaj, Principal** of the college. **Dr.M.Willjuice Iruthayarajan** HOD of EEE Department and Convener briefed the audience about the Event.

Various Engineering Colleges across the Country participated in this event in which 170 papers were received for paper presentation and 170 Technical quiz teams for the contest. Out of the above 65 papers, 50 technical quiz teams were short listed we invited eminent persons, **Mr.N.Arumugam (Associate Professor) ECE Department, Mr.G.Kannayeram (Assistant Professor Sr.Grade) EEE Department, Mrs.L.Kalaivani (Assistant Professor Sr.Grade) EEE Department, Mrs. R.V.Maheswari (Assistant Professor Sr.Grade) EEE Department, Mr.R.Karthik (Assistant Professor Sr.Grade) EEE Department, Mr.M.P.E.Rajamani (Assistant Professor Sr.Grade) EEE Department, Mr.N.B.Praksh (Assistant Professor Sr.Grade) EEE Department of NATIONAL ENGINEERING COLLEGE, Kovilpatti** for judging the winners of the above Events.



In the Inaugural function Chief Guest **Sri.Purushothaman, Executive Engineer, Distribution (TNEB)** congratulated the college for organizing such a grand event and highlighted the importance of such events in the student's carrier.

The following Events Were started at 10:00A.M on 01/02/2013

### *Paper Presentation*

This Event is a beacon of light for all those who are deeply involved in researching the different dimensions of science and engineering. It is designed to refine concepts, develop scientific attitude and approach towards problem statements. 170 papers were received for paper presentation. 65 Papers are selected for participation.

#### **Day 1:**

##### **SESSION-1:**

**First prize:** Ms. K.Ilamathi and Ms.S.Haritha  
Mepco Schlenk Engineering College, Sivakasi.  
**Second Prize:** Ms.R.Anitha  
Government college of Engineering , Tirunelveli.

##### **SESSION-2:**

**First prize:** Mr.S.Arunkumar and Mr.K.Hariharan  
K.S.Rangasamy college, Thiruchengode  
**Second Prize:** Ms.Akila and Ms.Karpagavinothini  
Kalasalingam Institute of Technology, Srivilliputhur.

#### **Day 2:**

##### **SESSION-3:**

**First prize:** Ms.Swapna and Ms.Swetha  
Mepco Schlenk Engineering College, Sivakasi.  
**Second Prize:** Mr.S.Arunraj and Mr.R.Manivasagam  
Sethu Institute of Technology, Maduari.

##### **SESSION-4:**

**First Prize:** Mr.J.Manikandaprasath  
PSNA College of Technology, Dindugal.

*Techie-Sizzers*

- First Prize:** Mr.Hariharan and Mr.Arun kumar  
K.S.Rangasamy Engineering College, Thiruchengode.
- Second Prize:** Mr.Arun Raj and Mr.Manivasagam  
Sethu Institute of Technology, Madurai.

*Lights Camera Action*

- First Prize:** Mr.Murugesh and Mr.Deepak naveen  
Government college of Engineering , Tirunelveli.

*Machinist*

- First Prize:** Mr.Sivaprasath and Mr.Lenin  
Sethu Institute of Technology, Madurai.
- Second Prize:** Mr.Sanmuga raja and Mr.Satheesh  
Mookambigai Engineering College, Coimbatore.

*Adventure Quest*

- First Prize:** Mr.Surjith and Mr.Mervin Steve  
Ponjesly Engineering College, Nagercoil.
- Second Prize:** Mr.Sankar and Mr.Amirta rasu  
Unnamalai Institute of Technology.

*Circuit Warriors*

- First Prize:** Mr.Manivasagam and Mr.Arunraj  
Sethu Institute of Technology, Madurai.
- Second Prize:** Ms.Shanmugapriya and Ms.Loganayagi  
PSR Engineering College, Sivakasi.

*AD-ZAp*

- First Prize:** Ms.V.Praveena  
Sona College of Technology.

**Dr.M.Willjuice Iruthayarajan**, Asso. Professor (Senior Grade) and **Head of the Department** of EEE Department, **National Engineering College**, **Dr. Kn.K.S.K.Chockalingam Director** of the college, **Dr.P.Lakshmi** Associate Professor, Department of EEE College of Engineering, Guindy, Anna University Chennai and **Mr.G.Kannayeram** Associate professor in **National Engineering College** were announced the winners of the above Events



**Student achievements:**

*Excellency shown by students of IV year EEE in campus recruitment to various companies.*

| S No | Name of the Student | PLACEMENTS |
|------|---------------------|------------|
| 1    | V.S.Asathy          | CTS        |
| 2    | P.Aswni             | CTS        |
| 3    | R.Danisha Regil     | TCS        |
| 4    | N.Gomathinayagam    | TCS        |
| 5    | N.S.Jamuna          | TCS        |
| 6    | D.Jenittta          | TCS        |
| 7    | A.Pramila Banu      | TCS        |
| 8    | P.Saran             | TCS        |
| 9    | S.Shanmuga Lakshmi  | TCS        |
| 10   | A.Sowmya            | TCS        |



**Publications and awards in inter institute events by students:**

The following students awarded in various co-curricular and extra curricular activities.

1. Ms.D.Jennita – Best Outgoing Student (College)
2. Ms.B.Aneesha – Overall Champion, Female
3. Mr.T.Karkuvelraja – Best NCC cadet
4. Mr.R.Shylin Babu – Best IEEE Volunteer

|     | Name of the Program  | Organizer                         | Name of the Student/s | Rank/Status | Event                      |
|-----|----------------------|-----------------------------------|-----------------------|-------------|----------------------------|
| 1.  | FESTORASH'13         | St.Joseph College Of Engg         | T.Karkuvelraja        | II          | Project Presentation       |
| 2.  | ELITE'2K13           | National engg College, kovilpatti | T.Karkuvelraja        | II          | Paper presentation         |
| 3.  | Mechmerize'13        | Kumaraguru College Of Tech        | T.Karkuvelraja        | III         | Industrial Defined Problem |
| 4.  | COMMUNIX'13          | K.S.R.College of Tech             | T.Karkuvelraja        | III         | Project Presentation       |
| 5.  | TECHNOWAR'13         | Surya Group Of Institutions       | T.Karkuvelraja        | III         | Project Expo               |
| 6.  | START'2K13           | Bangalore College Of Engg & Tech  | T.Karkuvelraja        | I           | Paper Presentation         |
| 7.  | INTER COLLEGE        | Theni Kammavar Engg college       | N.Karthick Maharajan  | I           | Paper Presentation         |
| 8.  | INTER COLLEGE        | Theni Kammavar Engg college       | S.M.S.Annamalai Samy  | I           | Paper Presentation         |
| 9.  | ELCON'13             | National engg College, kovilpatti | R.Gulasekarka Pandian | I           | Paper presentation         |
| 10. | ELCON'13             | National Engg College, Kovilpatti | V.Ramesh              | I           | Paper presentation         |
| 11. | ELCON'13             | National Engg College, Kovilpatti | D.Balaji              | I           | Paper presentation         |
| 12. | National Cadet Corps | National Engg College, Kovilpatti | T.Karkuvelraja        | II          | Situatuion Reality Test    |
| 13. | EVIZIA'12            | RVS College Of Engg.&Tech         | T.Karkuvelraja        | II          | Tech Talk                  |
| 12  | EVIZIA'12            | RVS College Of Engg.&Tech         | T.Karkuvelraja        | II          | Quiz                       |

|     |                    |  |                             |     |                    |
|-----|--------------------|--|-----------------------------|-----|--------------------|
| 14. | EVIZIA'12          | RVS College Of Engg.&Tech                    | C.Selvarathinam             | II  | Quiz               |
| 15. | EVIZIA'12          | RVS College Of Engg.&Tech                    | C.Selvarathinam             | II  | Tech Talk          |
| 16. | IE CLUB            | National Engg College, Kovilpatti            | R.Gopinath                  | I   | Paper presentation |
| 17. | IE CLUB            | National Engg College, Kovilpatti            | G.Edwin Jose                | I   | Paper presentation |
| 18. | IE CLUB            | National Engg College, Kovilpatti            | P.Dheiva vadivu Vishnupriya | II  | Paper presentation |
| 19. | IE CLUB            | National Engg College, Kovilpatti            | V. Alice Sugunabai          | I   | Paper presentation |
| 20. | IE CLUB            | National Engg College, Kovilpatti            | A.Eswari @ Abirami          | I   | Paper presentation |
| 21. | IE CLUB            | National Engg College, Kovilpatti            | G. Jasmine Jeba             | II  | Paper presentation |
| 22. | IE CLUB            | National Engg College, Kovilpatti            | T.J Graslin Rosory Shiney   | II  | Paper presentation |
| 23. | IE CLUB            | National Engg College, Kovilpatti            | M. S. Archana               | II  | Paper presentation |
| 24. | Fine and Arts Club | National Engg College, Kovilpatti            | V.Suresh Kumar              | II  | Solo Dance         |
| 25. | SPORTS             | National Engg College, Kovilpatti            | V.Suresh Kumar              | III | Long jump          |
| 26. | SPORTS             | National Engg College, Kovilpatti            | V.Suresh Kumar              | II  | kabadi             |
| 27. | SPORTS             | National Engg College, Kovilpatti            | V.Suresh Kumar              | II  | Relay              |
| 28. | INTER COLLEGE      | Vellore Thanthai Periyar Engineering College | R.S.Saravana kumar          | II  | Paper presentation |
| 29. | INTER COLLEGE      | Vellore Thanthai Periyar Engineering College | Uma Maheshwaran             | II  | Paper presentation |
| 30. | LITERARY CLUB      | National Engg College, Kovilpatti            | P.Bala Murugan              | I   | Paper presentation |
| 31. | LITERARY CLUB      | National Engg College, Kovilpatti            | Mohamed suhail              | I   | Paper presentation |



|     |                    |                                      |                           |     |                       |
|-----|--------------------|--------------------------------------|---------------------------|-----|-----------------------|
| 32. | LITERARY CLUB      | National Engg College,<br>Kovilpatti | Saradha Devi              | III | Group<br>Discussion   |
| 33. | LITERARY CLUB      | National Engg College,<br>Kovilpatti | G. Sridevi                | III | Group<br>Discussion   |
| 34. | LITERARY CLUB      | National Engg College,<br>Kovilpatti | C. Sangeetha              | III | Group<br>Discussion   |
| 35. | LITERARY CLUB      | National Engg College,<br>Kovilpatti | B. Rizwana<br>Raseena     | III | Group<br>Discussion   |
| 36. | LITERARY CLUB      | National Engg College,<br>Kovilpatti | S. Rama Sankari           | III | Group<br>Discussion   |
| 37. | LITERARY CLUB      | National Engg College,<br>Kovilpatti | S. Selvajothi             | III | Group<br>Discussion   |
| 38. | LITERARY CLUB      | National Engg College,<br>Kovilpatti | P. Nanthinidevi           | III | Group<br>Discussion   |
| 39. | SCINEC'13          | National Engg College,<br>Kovilpatti | P.Bala Murugan            | I   | Paper<br>presentation |
| 40. | SCINEC'13          | National Engg College,<br>Kovilpatti | M.Gokul Sakthivel         | I   | Paper<br>presentation |
| 41. | SPORTS             | National Engg College,<br>Kovilpatti | G.K.Archana<br>Dharshini  | II  | Table tennis          |
| 42. | Fine and Arts club | Izhakiya Peravai,<br>Madurai         | S.T.Angalaparames<br>wari | III | Tamil speech          |
| 43. | SPORTS             | National Engg College,<br>Kovilpatti | S.M.K. Udhai vijay        | II  | Basket Ball           |
| 44. | SPORTS             | National Engg College,<br>Kovilpatti | J.Inania                  | I   | Volley Ball           |
| 45. | SPORTS             | National Engg College,<br>Kovilpatti | A.S.Aashika Rani          | I   | Ball Badminton        |
| 46. | SPORTS             | National Engg College,<br>Kovilpatti | B.Aneesha                 | I   | Long jump             |
| 47. | SPORTS             | National Engg College,<br>Kovilpatti | B.Aneesha                 | II  | 200 Meter             |
| 48. | SPORTS             | National Engg College,<br>Kovilpatti | B.Aneesha                 | II  | 400 Meter             |
| 49. | SPORTS             | National Engg College,<br>Kovilpatti | B.Aneesha                 | III | 100 Meter             |
| 50. | SPORTS             | National Engg College,<br>Kovilpatti | B.Aneesha                 | II  | 4*100 Meter           |

|     |               |  |                              |                |                         |
|-----|---------------|--|------------------------------|----------------|-------------------------|
| 51. | SPORTS        | National Engg College,<br>Kovilpatti             | J.Esther Nancy               | I              | Throw ball              |
| 52. | SPORTS        | National Engg College,<br>Kovilpatti             | T.J.Graslin Rosory<br>Shiney | I              | Throw ball              |
| 53. | SPORTS        | National Engg College,<br>Kovilpatti             | T.Jemima Vallimiyil          | II             | Ball Badminton          |
| 54. | SPORTS        | National Engg College,<br>Kovilpatti             | M. Manogari                  | II             | Throw Ball              |
| 55. | SPORTS        | National Engg College,<br>Kovilpatti             | M. Manogari                  | I              | 4*100 meter<br>relay    |
| 56. | SPORTS        | National Engg College,<br>Kovilpatti             | M. Manogari                  | II             | Discus throw            |
| 57. | SPORTS        | National Engg<br>College,Kovilpatti              | M. Manogari                  | I              | 400 meter               |
| 58. | SPORTS        | National Engg College,<br>Kovilpatti             | A. Aishwaryaa                | II             | Table Tennis            |
| 59. | SPORTS        | National Engg College,<br>Kovilpatti             | R. Sneha                     | I              | Carrom                  |
| 60. | SPORTS        | National Engg<br>College,Kovilpatti              | A. Jenifer Romina            | II             | Throw Ball              |
| 61. | SPORTS        | National Engg College,<br>Kovilpatti             | G. Malarkodi                 | I              | 4*100 meter<br>relay    |
| 62. | SPORTS        | National Engg<br>College,Kovilpatti              | G. Malarkodi                 | II             | Throw Ball              |
| 63. | SPORTS        | National Engg College,<br>Kovilpatti             | S. Siddarth<br>Gautham       | III            | 100 meter               |
| 64. | SPORTS        | National Engg College,<br>Kovilpatti             | S. Siddarth<br>Gautham       | III            | High Jump               |
| 65. | QUIZ CLUB     | National Engg College,<br>Kovilpatti             | T. Suriya                    | II             | Quiz                    |
| 66. | Inter College | SCAD College Of<br>Engineering And<br>Technology | V.Alice Sugunabai            | I              | Poster<br>Presentation  |
| 67. | Inter College | SCAD College Of<br>Engineering And               | J.Esther Nancy               | I              | Poster<br>Presentation  |
| 68. | SIPRO'13      | National Engg College,<br>Kovilpatti             | T. Thiyagu                   | Best &<br>cash | Project<br>Presentation |
| 69. | SIPRO'13      | National Engg College,<br>Kovilpatti             | Rooban<br>Karthick.K.S       | Best &<br>cash | Project<br>Presentation |

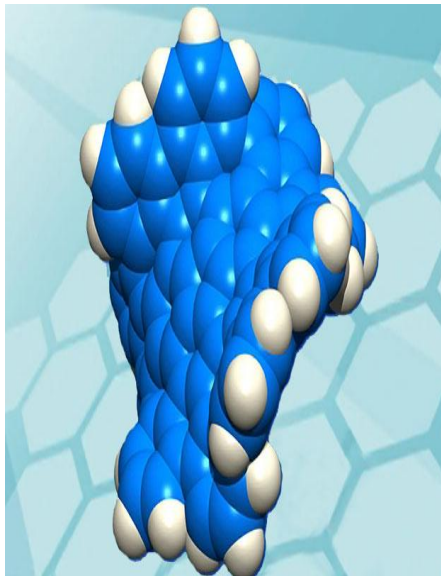
|     |               |                                      |                      |                |                         |
|-----|---------------|--------------------------------------|----------------------|----------------|-------------------------|
| 70. | SIPRO'13      | National Engg College,<br>Kovilpatti | Sundara Moorthi      | Best &<br>cash | Project<br>Presentation |
| 71. | SIPRO'13      | National Engg College,<br>Kovilpatti | Ramesh               | Best &<br>cash | Project<br>Presentation |
| 72. | SIPRO'13      | National Engg College,<br>Kovilpatti | C. Selvarathinam     | Best &<br>cash | Project<br>Presentation |
| 73. | SIPRO'13      | National Engg College,<br>Kovilpatti | V. Karthik           | Best &<br>cash | Project<br>Presentation |
| 74. | SIPRO'13      | National Engg College,<br>Kovilpatti | T. Karkuvel Raja     | Best &<br>cash | Project<br>Presentation |
| 75. | SIPRO'13      | National Engg College,<br>Kovilpatti | S. Karthick          | Best &<br>cash | Project<br>Presentation |
| 76. | EWAR'12       | Velammal College Of<br>Engg, Madurai | R.Shylin babu        | III            | Bomb Diffusal           |
| 77. | EWAR'12       | Velammal College Of<br>Engg, Madurai | R.Shylin babu        | II             | Paper<br>presentation   |
| 78. | EWAR'12       | Velammal College Of<br>Engg, Madurai | R.Ashok              | III            | Bomb Diffusal           |
| 79. | ELECSPIRE'12  | Chandy College Of<br>Engg, Tuticorin | N.S.Jamuna           | I              | Paper<br>presentation   |
| 80. | ELECSPIRE'12  | Chandy College Of<br>Engg, Tuticorin | D.Jenitta            | I              | Paper<br>presentation   |
| 81. | REGNIX'12     | J.P.College Of Engg                  | K.Priya dharshini    | III            | Paper<br>presentation   |
| 82. | REGNIX'12     | J.P.College Of Engg                  | I.Roja               | III            | Paper<br>presentation   |
| 83. | JAFO WOCHE    | National Engg College,<br>Kovilpatti | R.Danisha regil      | II             | Pictionary              |
| 84. | JUNIOR JAYCEE | National Engg College,<br>Kovilpatti | R.Danisha regil      | I              | Treasure Hunt           |
| 85. | SIPRO'12      | National Engg College,<br>Kovilpatti | N.Gomathi<br>Nayagam | I              | Project<br>Presentation |
| 86. | TECHDEFI'12   | National Engg College,<br>Kovilpatti | R.Shylin babu        | I              | Paper<br>presentation   |
| 87. | SPECTRO'12    | Cape Institute Of Tech               | T.Deepthi            | III            | Project<br>Presentation |
| 88. | SPECTRO'12    | Cape Institute Of Tech               | T.Arun devi          | III            | Project<br>Presentation |

|     |                    |                                      |                         |     |                       |
|-----|--------------------|--------------------------------------|-------------------------|-----|-----------------------|
| 89. | IEINEC'12          | National Engg College,<br>Kovilpatti | T.Karkuvelraja          | II  | Paper<br>presentation |
| 90. | IEINEC'12          | National Engg College,<br>Kovilpatti | J.S.JAYSHA              | II  | QUIZ                  |
| 91. | IEINEC'12          | National Engg College,<br>Kovilpatti | G.Jasmine Jeba          | III | Paper<br>Presentation |
| 92. | IEINEC'12          | National Engg College,<br>Kovilpatti | M.Venkadesh             | I   | QUIZ                  |
| 93. | IEINEC'12          | National Engg College,<br>Kovilpatti | M.Venkadesh             | I   | Paper<br>Presentation |
| 94. | IEINEC'12          | National Engg College,<br>Kovilpatti | T.Thiyagu               | I   | Paper<br>Presentation |
| 95. | IEINEC'12          | National Engg College,<br>Kovilpatti | V.Karthik               | II  | Paper<br>Presentation |
| 96. | IEINEC'12          | National Engg College,<br>Kovilpatti | A.Eswari @<br>Abirami   | III | Paper<br>Presentation |
| 97. | IEINEC'12          | National Engg College,<br>Kovilpatti | S.Divya                 | II  | QUIZ                  |
| 98. | IEINEC'12          | National Engg College,<br>Kovilpatti | Annamalai<br>samy.s.m.s | I   | QUIZ                  |
| 99. | IEINEC'12          | National Engg College,<br>Kovilpatti | T.Sutharani             | III | Paper<br>presentation |
| 100 | IEINEC'12          | National Engg College,<br>Kovilpatti | N.S.Jamuna              | I   | Paper<br>presentation |
| 101 | IEINEC'12          | National Engg College,<br>Kovilpatti | D.Jenitta               | I   | Paper<br>presentation |
| 102 | IEINEC'12          | National Engg College,<br>Kovilpatti | T.Zipporah              | III | Paper<br>presentation |
| 103 | IEINEC'12          | National Engg College,<br>Kovilpatti | T.Arun devi             | II  | Paper<br>presentation |
| 104 | IEINEC'12          | National Engg College,<br>Kovilpatti | T.Karuppasamy           | III | QUIZ                  |
| 105 | LITERARY CLUB      | National Engg College,<br>Kovilpatti | M.Karthika              | I   | Spell Bee & Jam       |
| 106 | SAE CLUB           | National Engg College,<br>Kovilpatti | L.Arun Prakash          | III | Car drawing           |
| 107 | Fine and Arts Club | V.O.C Arts And<br>Science College,   | L.Arun Prakash          | II  | Piano playing         |

|     |            |                                      |                                |     |                |
|-----|------------|--------------------------------------|--------------------------------|-----|----------------|
| 108 | SPORTS     | National Engg College,<br>Kovilpatti | B. Aneesha                     | I   | 400 meter      |
| 109 | SPORTS     | National Engg College,<br>Kovilpatti | B. Aneesha                     | II  | 200 meter      |
| 110 | SPORTS     | National Engg College,<br>Kovilpatti | B. Aneesha                     | III | 100 meter      |
| 111 | SPORTS     | National Engg College,<br>Kovilpatti | T. J. Graslin Rosary<br>Shiney | II  | Volley Ball    |
| 112 | SPORTS     | National Engg College,<br>Kovilpatti | T. Jemima<br>Vallimayil        | II  | Ball Badminton |
| 113 | SPORTS     | National Engg College,<br>Kovilpatti | S. Divya                       | II  | Ball Badminton |
| 114 | SPORTS     | National Engg College,<br>Kovilpatti | J. Esther Nancy                | I   | Throw Ball     |
| 115 | SPORTS     | National Engg College,<br>Kovilpatti | Murali kumar                   | I   | kabadi         |
| 116 | SPORTS     | National Engg College,<br>Kovilpatti | Lachiya bharathi               | II  | football       |
| 117 | SPORTS     | National Engg College,<br>Kovilpatti | Sam maxwell                    | II  | football       |
| 118 | SPORTS     | National Engg College,<br>Kovilpatti | Narayanan                      | I   | Hockey         |
| 119 | SPORTS     | National Engg College,<br>Kovilpatti | Saravana kumar                 | II  | hockey         |
| 120 | SPORTS     | National Engg College,<br>Kovilpatti | Naveen lingam                  | I   | hockey         |
| 121 | SPORTS     | National Engg College,<br>Kovilpatti | Arun kumar                     | II  | hockey         |
| 122 | CALYSTA'12 | National Engg College,<br>Kovilpatti | B. Aneesha                     | II  | Group Dance    |
| 123 | CALYSTA'12 | National Engg College,<br>Kovilpatti | E. Praisline Golda             | II  | Group Dance    |
| 124 | CALYSTA'12 | National Engg College,<br>Kovilpatti | T.J. Graslin Rosary<br>Shiney  | II  | Group Dance    |
| 125 | CALYSTA'12 | National Engg College,<br>Kovilpatti | T. Jemima<br>Vallimayil        | II  | Group Dance    |
| 126 | CALYSTA'12 | National Engg College,<br>Kovilpatti | T. Thanga Lakshmi              | II  | Group Dance    |

TECHNICAL ARTICLES

## New Form of Carbon Takes Graphene Into a New Dimension



Nearly three decades ago, our understanding that there were three basic forms of carbon—diamond, graphite, and amorphous carbon—was stood on its head with the introduction of fullerenes, then carbon nanotubes, and more recently graphene.

Now researchers at Boston College and Nagoya University have synthesized another new form of carbon unofficially dubbed “grossly warped nanographenes.” The research, which was published in the journal *Nature Chemistry* (“A grossly warped nanographene and the consequences of multiple odd-membered-ring defects”), has led to creating a material that is essentially defects in the two-dimensional hexagonal honeycomb-like arrangements of trigonal carbon atoms found in graphene. These defects consist of non-hexagonal rings that force distortions out of the two-dimensional plane.

The grossly warped nanographene consists of 80 carbon atoms joined together in a network of 26 rings, with 30 hydrogen atoms on the outside rim. In contrast to graphene sheets, which typically have planar two-dimensional geometries, the new material juts out from a single plane because of the five 7-membered rings and one 5-membered ring embedded in the hexagonal lattice of carbon atoms.

Pushing its geometry out of planarity has altered the new material's physical, optical, and electronic properties vis-à-vis its carbon cousins.

“Our new grossly warped nanographene is dramatically more soluble than a planar nanographene of comparable size,” said Lawrence T. Scott, professor at Boston College and one of the principal authors of the research, in a press release. “The two differ significantly in color, as well. Electrochemical measurements revealed that the planar and the warped nanographenes are equally easily oxidized, but the warped nanographene is more difficult to reduce.”

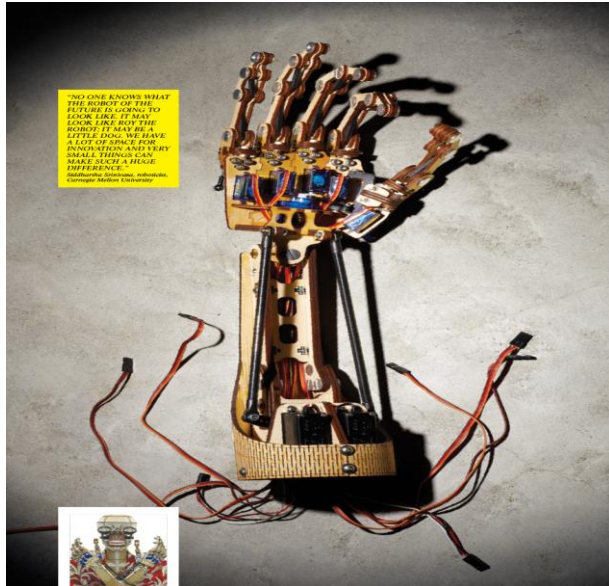
These are just the initial differentiating characteristics of this new form of carbon. If the near-decade-long history of graphene is any guide, we can expect new properties to be discovered on a regular basis. (Just this week, for example, researchers discovered in measurements that the response rate of an optical switch using graphene is 100 times faster than traditional materials.)

Whether the so-called “grossly warped nanographenes” will offer the same wealth of new characteristics as graphene remains to be seen. However, it would seem that graphene is now not only facing competition from other 2-D materials, but from an entirely new form of carbon.

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## ROBOTIC PERFORMER



Brian Roe spent nearly a decade building animatronic monsters for films such as *Virus*, *A.I.*, and *Scooby Doo 2*. Then, almost overnight, Hollywood abandoned mechanical characters for computer renderings. Roe now works as a technology consultant, but with the surge of cheap, user-friendly microelectronics, he saw a market emerging for hobbyist robots. “It used to be that electronics and software were out of reach,” Roe says. “Over the past six or eight years, it has completely switched.” So Roe began developing a low-cost kit to teach anyone robotics. He calls his work-in-progress Roy the Robot.

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For now, Roy is a head, neck, and pair of lower arms. Yet, with about 1,200 parts controlled by animatronics software, the robot already looks and moves like a human. Roe laser-cut the robot’s frame from pliable, lightweight wood to retain complex architecture while keeping costs low. Twenty-eight inexpensive servomotors help Roy gesture with his hands; move his wrist, neck, and jaw; and even blink his eyes.

To complete Roy’s upper arms and shoulders, Roe launched a successful crowdfunding campaign and sent backers DIY kits based on the hands and arms. He eventually hopes to sell the kits for about \$300. That would fill a need for inexpensive manipulators. “The cheapest capable robotic arms are in the \$20,000 range,” says Siddhartha Srinivasa, a roboticist at Carnegie Mellon University.

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# Netherlands Builds Nationwide EV Fast-Charging Network



Range anxiety is real for electric vehicle (EV) drivers. But it will soon be a thing of the past for EV owners in the Netherlands.

Fastned, a Dutch electric vehicle charging network company, has chosen ABB to provide more than 200 DC fast-charging stations that will blanket the country of more than 16 million people. The chargers will all be within 50 kilometers of each other.

It is not surprising that Fastned chose ABB to provide the charging stations, since the Fastned founders worked at a Dutch EV charging company called Epyon B.V., which was acquired by ABB in 2011.

The network will be the world's largest nationwide fast-charging system to-date. The multi-standard chargers will bypass the standards war that is going on in DC fast charging by offering both Japan's CHAdeMO and the Combined Charging System (CCS) from the Society of Automotive Engineers. The average charge will take 15-30 minutes with a 50-kilowatt charger. The entire network should be built by 2015. Every station, which will be next to already-existing service stations on the highway, will be equipped with solar roof tiles.

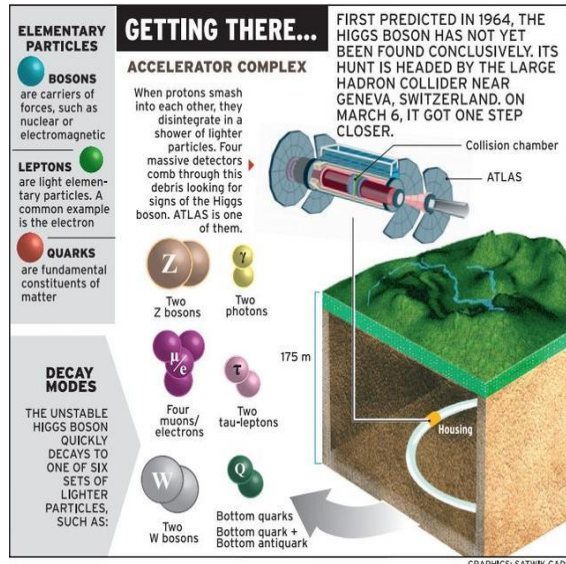
"This countrywide network of locations will lay the basis for the commercially viable development of e-mobility," Bart Lubbers, one of Fastned's founders, said in a statement. "I foresee a race towards faster charging and larger batteries throughout the car industry."

Of course faster charging means more strain on the electrical grid, so local utilities have to be on board for charging stations. In the U.S. for example, Walgreens installed more than 800 EV charging stations at its stores, but only a fraction of them could be DC fast chargers because in many store locations the power infrastructure could not support the chargers.

For nations or states that are bullish about electric vehicle networks, however, utilities will increasingly have to comply. California is also building a \$122 million network of about 200 DC fast chargers and laying the groundwork for up to 10,000 240-volt level 2 chargers, which will be deployed by NRG Energy.

If a true statewide charging network is built across California, it would dwarf the system in the Netherlands, which is a little bigger than Maryland. A superhighway across the entire U.S. is even more elusive, although EV carmaker Tesla wants to do just that. Unlike the Fastned stations, however, they will be about every 130 to 160 kilometers, instead of every 50. And while the charging would be free on the Tesla network, which it won't be in California or the Netherlands, it will only be available to owners of the Tesla Model S.

# HIGGS BOSON THEORY



Ever since CERN announced that it had spotted a Higgs boson-like particle on July 4, 2012, their flagship Large Hadron Collider (LHC), apart from similar colliders around the world, has continued running experiments to gather more data on the elusive particle.

The latest analysis of the results from these runs was presented at a conference now underway in Italy. While it is still too soon to tell if the one spotted in July 2012 was the Higgs boson as predicted in 1964, the data is convergent toward the conclusion that the long-sought particle does exist and with the expected properties. More results will be presented over the upcoming weeks.

In time, particle physicists hope that it will once and for all close an important chapter in physics called the Standard Model (SM).

The announcements were made by more than 15 scientists from CERN on March 6 via a live webcast from the Rencontres de Moriond, an annual particle physics forum that has been held in La Thuile, Italy, since 1966.

“Since the properties of the new particle appear to be very close to the ones predicted for the SM Higgs, I have personally no further doubts,” Dr. Guido Tonelli, former

Interesting results from searches for other particles, as well as the speculated nature of fundamental physics beyond the SM, were also presented at the forum, which runs from March 2-16.

A key goal of the latest results has been to predict the strength with which the Higgs couples to other elementary particles, in the process giving them mass.

This is done by analysing the data to infer the rates at which the Higgs-like particle decays into known lighter particles: W and Z bosons, photons, bottom quarks, tau leptons, electrons, and muons. These particles’ signatures are then picked up by detectors to infer that a Higgs-like boson decayed into them.

The SM predicts these rates with good precision.

Thus, any deviation from the expected values could be the first evidence of new, unknown particles. By extension, it would also be the first sighting of ‘new physics’.

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